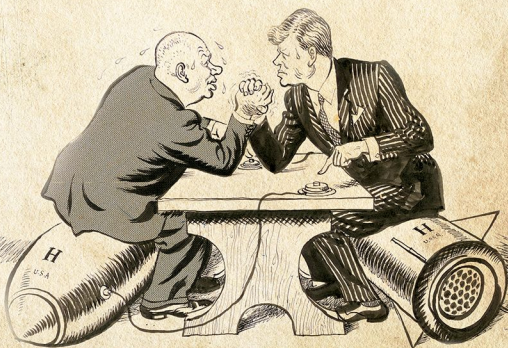# Arms Races in International Politics

From the Nineteenth to the Twenty-First Century

Edited by
Thomas Mahnken, Joseph Maiolo,
and David Stevenson

ARMS RACES IN INTERNATIONAL POLITICS

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International Politics

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To Deborah, Mari, and Sue

Acknowledgements

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PART IV: EXTRA-EUROPEAN ARMS RACES AND DEVELOPMENTS SINCE THE COLD WAR

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List of Abbreviations

ACS	Archivio Centrale dello Stato, Rome, Italy
ADIZ	Air Defence Identification Zone
AMS	Academy of Military Sciences (China)
APRF	Arkhiv Prezidenta Rossiiskoi Federatsii, Moscow, Russia
ASBM	Anti-Ship Ballistic Missile
A2/AD	Anti-Access/Area Denial
BA	Bundesarchiv, Berlin, Germany
BA-MA	Bundesarchiv-Militärchiv, Freiburg, Germany
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance
CASC	China Aerospace Science and Technology Corporation
CASIC	China Aerospace Science and Industry Corporation
CCAC	Churchill College Archive Centre, Cambridge, United Kingdom
CFE	Conventional Armed Forces Europe
CFL	Cease Fire Line
CGS	Chief of the General Staff
CMC	Central Military Commission (China)
CPI	Communist Party of India
CSDN	Conseil supérieur de la défense nationale
CSSC	China State Shipbuilding Corporation
DDF	*Documents diplomatiques français 1871–1914* (41 vols., Paris, 1929–59)
ENC	Eastern Naval Command (China)
FRUS	*Foreign Relations of the United States*
GP	Johannes Lepsius, Albrecht Mendelssohn-Bartholdy, and Friedrich Thimme, eds., *Die große Politik der europäischen Kabinette 1871–1914* (40 vols., Berlin, 1922–7)
GPS	Global Positioning System
HIC	High Intensity Conflict
IBRD	International Bank for Reconstruction and Development
ICBM	Intercontinental Ballistic Missile
IDF	Israel Defense Forces
IMF	International Monetary Fund
INF	Intermediate-Range Nuclear Forces
JDAM	Joint Direct Attack Munition
JKLM	John F. Kennedy Presidential Library & Museum, Boston, USA
JSTARS	Joint Surveillance and Targeting System
LC	Library of Congress, Washington D.C., USA
LGB	Laser-guided Bomb
LIC	Low Intensity Conflict
LoC	Line of Control
MRBM	Medium Range Ballistic Missiles

MTR   Military-Technological Revolution
NARA   National Archives and Records Service, College Park MD, USA
NATO   North Atlantic Treaty Organization
NDU   National Defence University (China)
NEFA   North East Frontier Agency
NMML   Nehru Memorial Museum and Library
ONI   US Navy, Office of Naval Intelligence
PAAA   Politisches Archiv des Auswärtigen Amtes, Berlin, Germany
PGM   Precision Guided Munitions
PLA   Chinese People's Liberation Army
PLAAF   Chinese People's Liberation Army Air Force
PLO   Palestine Liberation Organization
PNG   Precision Navigation and Timing
PRC   People's Republic of China
QDR   Quadrennial Defense Review
RDA   Research, Development and Acquisition
RGANI   Rossiiskii Gosudarstvennyi Arkhiv Noveishei Istorii, Moscow, Russia
RMA   Revolution in Military Affairs
SAM   Surface to Air Missile
SHA   Service historique de l'armée de terre, Vincennes, France
SLBM   Submarine Launched Ballistic Missile
SIPRI   Stockholm International Peace Research Institute
SWJN   *Selected Works of Jawaharlal Nehru*
TNA   The National Archives, Kew, United Kingdom
TTK   Tiruvellore Thattai Krishnamachari Papers
UAV   Unmanned Aerial Vehicle (Drone)
USMM   Ufficio Storico della Marina Militare, Rome, Italy
WTO   World Trade Organization

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Introduction

Joseph Maiolo

Armed rivalry between political communities is ancient, but arms races are much more recent. Most scholars agree that both the term and the phenomenon it refers to originated in the nineteenth century. By the 1840s industrialization had revolutionized weapons manufacture. Armies seized on the communications and transport revolution embodied in the spread of telegraphs and railways, while navies exchanged masts and sails for steel hulls, steam engines, and screw propellers. The pace of change in artillery, rifles and logistics accelerated, and with it the urge to keep pace with potential enemies, especially after Prussia demonstrated in the wars of German unification how the new technologies and mass conscript armies could combine with systematic planning to achieve swift and decisive results.[1]

Who and in what language coined the sporting metaphor to describe the new form of intense military competition is difficult to determine.[2] Its first use in the British House of Commons occurred on 20 March 1894, when the Radical MP and champion of international arbitration, William Randal Cremer, decried large increases in the navy's budget as a 'mad race of naval expenditures'.[3] Victorian liberals such as Cremer and Richard Cobden, and their socialist counterparts on the Continent such as Karl Kautsky, saw excessive arms expenditure as a tragic diversion of wealth away from social goods and productive investments and as symptomatic of the twin evils of militarism and authoritarianism and the excesses of capitalism and imperialism.[4] Late-nineteenth-century denunciations and diagnoses of the phenomenon did not, of course, prevent land and naval arms rivalries from gaining momentum in the first decade of the twentieth. By then the use of the sporting metaphor had become more common and was often invoked to frame the developing naval competition between Britain and Germany. In January 1907, for instance, Admiral Eduard Capelle, a top adviser to the German Navy Secretary, Grand Admiral Alfred von Tirpitz, warned against increasing the tempo of

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[1] W. H. McNeill, *The Pursuit of Power: Technology, Armed Force, and Society since A.D. 1000* (Oxford, 1983), 185–236.

[2] The term arms race is now in common usage in French (*Course aux armements*); German (*Wettrüsten*); Italian (*Corsa agli armamenti*); Spanish (*carrera de armamentos*); Russian (гонка вооружений); Japanese (軍備拡張競争) and Chinese (军备竞赛). Hindi and Urdu speakers use the English term.

[3] Parliamentary Debates, House of Commons, Hansard, 4th Series, Vol. 22 (1894), p. 734; on Cremer *see* Paul Laity, *The British Peace Movement 1870–1914* (Oxford, 2002).

[4] Nicholas Stargardt, *The German Idea of Militarism: Radical and Socialist Critics 1866–1914* (Cambridge, 1994).

battleship construction, because Germany 'would be tarred with the stigma of starting an arms race'.[5] That intention indeed proved difficult to conceal and the naval race accelerated. In 1908 the courtier and military lobbyist Lord Esher voiced popular sentiment in Britain when he demanded that, 'for every ship which our great rival builds, [we need] to build two of equal strength. Let Germany force the pace, but let England win the race.'[6]

During the retrospective search for the causes of the Great War, the arms race became the focus of intense scholarly and public debate. One of the most authoritative pronouncements on the topic came from Lord Grey, who had been Britain's foreign secretary in 1914. To him history had taught a clear lesson: 'It is that great armaments lead inevitably to war. If there are armaments on one side there must be armaments on the other sides. While one nation arms, other nations cannot tempt it to aggression by remaining defenceless […] Each measure taken by one nation is noted and leads to countermeasures by others.'[7] Grey's description of the arms race and his early articulation of what international relations theorists would later call the action-reaction model were typical of post-1919 liberal internationalist thought on both sides of the Atlantic. Liberal internationalists saw the origins of the war not in the actions of any one great power, but in what the philosopher Goldsworthy Lowes Dickinson described in the title of his 1917 book as *The European Anarchy*. For Dickinson, and others like him who, in 1919, supported the foundation of the League of Nations to prevent future wars, the insecurity of a world without law and order drove the powers to protect themselves through the competitive acquisition of armaments. This idea that reciprocal arming propelled by fear could spiral into war fitted comfortably into an intellectual framework that ascribed outcomes in world politics to structures and processes, as well as into the revisionist historiographical trend of the inter-war years, which held that war had broken out in 1914 not as a result of a premeditated plan hatched in Berlin, but inadvertently.[8] The idea was also compatible with the radical theory that private arms manufacturers exploited international conflicts to profit from the sale of munitions. Philip Noel-Baker, Professor of International Relations at the London School of Economics and Political Science, advanced the 'merchants of death' thesis most forcefully in his monumental study *The Private Manufacture of Armaments* (1931).[9]

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[5] Patrick J. Kelley, *Tirpitz and the Imperial German Navy* (Bloomington IN, 2011), 280.
[6] Lord Esher [Reginald Baliol Brett], 'Today and Tomorrow', *National Review* (1908), 389, reprinted in his *To-Day And To-Morrow And Other Essays* (London, 1910), 8–9.
[7] Viscount Grey of Fallodon, *Twenty-Five Years, 1892–1916*, Vol. I (London, 1925), pp. 89–90.
[8] David Stevenson, 'Learning From The Past: the Relevance of International History', *International Affairs* 90/1 (2014), 5–22; Jeanne Morefield, 'The Never-Satisfied Idealism of Goldsworthy Lowes Dickinson', in Ian Hall and Lisa Hill, eds., *British International Thinkers from Hobbes to Namier* (Basingstoke, 2009), 207–26; Casper Sylvest, *British Liberal Internationalism, 1880–1930: Making Progress?* (Manchester, 2009); Brian C. Schmidt, *The Political Discourse of Anarchy: A Disciplinary History of International Relations* (New York, 1997), 157–62, 194–6.
[9] Lorna Lloyd, 'Philip Noel-Baker and Peace Through Law', in David Long and Peter Wilson, eds., *Thinkers of the Twenty Years' Crisis: Interwar Idealism Reassessed* (Oxford University Press, 1995), 25–57.

During the Cold War the study of arms races became more systematic, without losing any of the passion and sense of urgency that had characterized it between the world wars. Indeed, Soviet–American rivalry created the alarming prospect of atomic blackmail and disarming nuclear first strikes. Anxiety that industrial and military elites pursued their own interests at the centre of the state by stoking the arms race did not diminish, but instead gained fresh credibility from an unlikely source when, in January 1961, President Dwight D. Eisenhower warned against the 'unwarranted influence' accrued by the 'military-industrial complex'.[10] In the burgeoning field of strategic studies, scholars tried to pin down the arms race phenomenon with numbers, models, and definitions. The mathematician Lewis Fry Richardson inspired a generation of quantitative research with his *Arms and Insecurity* (1960), in which he sought to build mathematical models of arms races to discover why they occurred, when they became unstable, and how they led to war.[11] Game theorists such as Thomas C. Schelling conceived of the Cold War arms race as a form of tacit bargaining through the competitive deployment of nuclear forces.[12] Perhaps the most influential contribution to the literature, however, was Samuel P. Huntington's 1958 essay 'Arms Races: Prerequisites and Results', which defined the phenomenon as 'a progressive, competitive peacetime increase in armaments by two states or coalitions of states resulting from conflicting purposes or mutual fears'.[13] Huntington also offered a series of important insights: for instance, he distinguished between races in the *quantity* and in the *quality* of armaments, and he considered which *types* of races were most likely to result in war. The effort to bring analytical precision to the study of arms racing was of course not simply a detached academic exercise, but was also intended to help forestall thermonuclear war. In *The Control of the Arms Race* (1961), Hedley Bull built on Huntington's insights to offer his own on how to avert global Armageddon: he distinguished for instance between the general goal of *disarmament*, and the limited one of *arms control*, though he saw both as overlapping and essential.[14]

Cold War theorizing about arms races underscored the difficulties of coming to grips with the phenomenon. Quantitative approaches lacked sufficient comparable data on key indicators such as military spending and weapons production, as well as a large enough number and variety of instances to draw upon for reliable modelling. It was difficult to pinpoint at what level of military expenditure states crossed the threshold from, on the one hand, routine upgrading of their forces to match new organizational and technical needs to, on the other, a full-blown arms race. Theoretical models, moreover, could not explain why some arms races ended

[10] James Ledbetter, *Unwarranted Influence: Dwight D. Eisenhower and the Military-Industrial Complex* (New Haven, 2011).

[11] Lewis F. Richardson, *Arms and Insecurity: A Mathematical Study of the Causes and Origins of War* (London, 1960). Richardson died in 1953. His work was published posthumously.

[12] Thomas C. Schelling, *Arms and Influence* (New Haven, 1966); George W. Downs and David M. Rocke, *Tacit Bargaining, Arms Races and Arms Control* (Ann Arbor, Michigan, 1990).

[13] Samuel P. Huntington, 'Arms Races: Prerequisites and Results', *Public Policy* 8 (1958), 41–86.

[14] Hedley Bull, *The Control of the Arms Race: Disarmament and Arms Control in the Missile Age* (London, 1961), ix–x, 5–6.

in wars, whereas others lost their momentum and ended in formal arms treaties or in tacit deals to suspend the contest.[15] Even when scholars agreed about methods and approaches to the subject, they diverged on key issues such as whether arms races produced independent war-promoting effects, or were merely symptoms of underlying economic and political tensions.[16] Theorists debated whether arms races were caused primarily by pressures building up within states or by external forces produced by those states' external interaction. The very term 'arms race' was problematic, not least because the metaphor can be misleading. Thus, races in athletics have clear start and finish lines, but arms races do not. The term also had polemical and pejorative overtones, implying that the expansion of arms was always headlong, dangerous, and irrational, rather than an act of deliberate and even prudent policy. After the Second World War, fears about the unintended consequences of arms racing were offset by fears of failing to arm enough to deter aggressors. During the Cold War, both sides drew the same lesson from the 1930s about the need to outgun potential foes. Each identified the main driver behind the arms race as the other's political–economic system: for Washington the Soviet Union stockpiled armaments because totalitarian communism was inherently expansionist; for Moscow the United States armed because capitalism was inherently imperialist.[17] When the nuclear arms race once more intensified in the early 1980s, officials in both Washington and Moscow pondered the intentions of their adversary and reflected on the policy implications of what scholars called the *deterrence* and the *spiral* models of arms races: would the nuclear rivalry spiral perilously until one side acted preemptively out of fear or until war came because of a computer malfunction, or would the failure to show resolve by keeping pace invite attack from an implacable foe?[18] Intriguingly, recent studies of the end of the Cold War underscore that it was both the perils and burdens of the arms race that convinced Ronald Reagan and Mikhail Gorbachev to stop it. As the President told an advisor in 1982, 'this inexorable building of nuclear weapons on our side and the Russians' side can only lead to Armageddon. We've got to get off that track.'[19] And in a similar vein the General Secretary told the Soviet Central Committee in 1985 that 'never before has such a terrible danger hung over the heads of humanity as in our

[15] For an insightful critique of arms race studies based on aggregate data and formal modelling, see George W. Downs, 'Arms Races and War', in Philip E. Tetlock, Jo L. Husbands, Robert Jervis, Paul C. Stern, and Charles Tilly, eds., *Behavior, Society, and Nuclear War* 2 Vols. (Oxford, 1991), ii, pp. 74–109.

[16] Compare for instance Michael D. Wallace, 'Arms Races and Escalation: Some New Evidence', *Journal of Conflict Resolution* 23/1 (1979), 3–16, and Paul Diehl, 'Arms Races and Escalation: A Closer Look', *Journal of Peace Research* 20/3 (1983), 205–12.

[17] David C. Engerman, 'Ideology and the Origins of the Cold War, 1917–1962', in Melvyn P. Leffler and Odd Arne Westad, eds., *The Cambridge History of the Cold War: Volume I Origins* (Cambridge, 2010), 20–43; Robert Jervis, 'Was the Cold War a Security Dilemma?' *Journal of Cold War Studies* (2001) 3/1, pp. 36–60.

[18] Robert Jervis, *Perception and Misperception in International Politics* (Princeton NJ, 1976), 58–113.

[19] James Graham Wilson, *The Triumph of Improvisation: Gorbachev's Adaptability, Reagan's Engagement, and the End of the Cold War* (New York, 2013), 67; on this point see also Richard Rhodes, *Arsenals of Folly: The Making of the Nuclear Arms Race* (New York, 2008); David E. Hoffman, *The Dead Hand: Reagan, Gorbachev and the Untold Story of the Cold War Arms Race* (New York, 2011).

times […] the only rational way out of the current situation is for the opposing forces to agree to immediately stop the arms race…'[20]

After the end of the Cold War and the collapse of the Soviet Union, academic interest in arms races declined. Other concerns came to the forefront of research in strategic studies, principally the democratic reform of security services in post-Soviet and Eastern bloc states, humanitarian intervention, international terrorism, state building, counter-insurgency warfare, military innovation, and cyber security. In recent years, however, the issue of arms competition between the major military powers has once again climbed up the global agenda. India and Pakistan are engaged in nuclear and conventional force rivalries. Iran and Saudi Arabia are locked into a military rivalry that threatens to turn nuclear. China's investment in advanced arms, including aircraft carriers, stealth aircraft, and missiles, has prompted some analysts to conclude that an arms race in East Asia is already underway.[21] Foreign minister Sergei Lavrov recently declared that Russia 'will not get drawn into a costly arms race,' but the crisis in Ukraine and rising spending on Russia's armed forces may provoke one anyway.[22] Rapid technological changes are also opening up new possibilities. An emerging rivalry in 'conventional prompt global strike' systems, for example, threatens to remove the inhibitions that the US–Soviet nuclear standoff once imposed on escalation in great power conflicts.[23] Competition in military robots for use in the air, on land, and on and under the sea may propel an arms race in autonomous fighting machines that could have apocalyptic repercussions.

As these developments suggest, the time has come for a renewed academic focus on the arms race phenomenon. Although since the end of the Cold War some important articles have appeared in political science journals,[24] the editors of this volume believe that what is now most needed to advance our knowledge and understanding of the subject is a book-length study that re-examines the theoretical foundations of arms race studies in the light of recent findings by historians.[25] Indeed, the most important development in the literature since the end of the Cold War has been intensive multi-archival historical research into nineteenth- and twentieth-century arms races. The opening up of the relevant archives has made possible a deeper and more sophisticated analysis. As no one writer could

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[20] Wilson, *The Triumph of Improvisation*, 91.

[21] Clarissa Tan, 'Asia's Arms Race', *The Spectator* (6 April 2013), 14–15.

[22] Reported by *Sputnik News*, 9 December 2014.

[23] James M. Acton, *Silver Bullet? Asking the Right Questions About Conventional Prompt Global Strike* (Carnegie Endowment for International Peace, 2013).

[24] For example Susan G. Sample, 'Arms Races and Dispute Escalation: Resolving the Debate', *Journal of Peace Research*, 34/1 (1997), 7–22; Andrew Kydd, 'Game Theory and the Spiral Model', *World Politics*, 49/3 (1997), 371–400; Charles L. Glaser, 'When Are Arms Races Dangerous? Rational versus Suboptimal Arming', *International Security* 28/4 (2004), 44–84.

[25] Grant T. Hammond, *Plowshares into Swords: Arms Races in International Politics, 1840–1991* (New York, 1993) attempts a comprehensive survey of arms races and offers a helpful critique of the theoretical literature, but its historical analysis is based solely on English-language sources and is now dated. Colin S. Gray offers a critique of Hammond and arms race theory generally in 'Arms Races and Other Pathetic Fallacies: A Case for Deconstruction', *Review of International Studies*, 22 (1996), 323–35.

now adequately survey the period covered by this volume, the editors have assembled a distinguished international team of scholars with wide-ranging expertise in the relevant archives, themes, and regions. We asked them to focus on two principal questions: what forces give rise to and sustain arms races, and what is the relationship between arms races and the outbreak of wars? We encouraged them to locate their answers, however, within a broad contemporary context. Part of the fascination of studying arms racing is that the subject lies at the intersection of many different historical specialisms: political, diplomatic, technological, economic, and ideological, as well as military. Although there is a good deal of consensus about the list of major historical instances of arms races, the phenomenon remains easier to identify than to define. The editors have not attempted to impose uniform definitions of key terms, including that of an 'arms race', but we have encouraged the contributors to use such terms consistently and advisedly. We did, however, suggest to our authors that they would find valuable the interpretative framework proposed by Barry Buzan and Eric Herring in their study of *The Arms Dynamic in World Politics*. Buzan and Herring suggest that arms races are an extreme manifestation of an underlying complex of pressures that induce states to arm and to enhance the quantity and quality of their armed forces. They use the term *maintenance* to describe the routine upgrading of forces in normal circumstances, and reserve that of *arms race* for when 'actors are going flat out or almost flat out in major competitive investments in military capability'.[26]

In explaining exactly how and why the military dynamic between states moves along the spectrum from maintenance to all-out racing, the editors asked the contributors to consider the applicability of three models of how arms races are driven.

The first model conceives of technological change as an autonomous variable, propelling arms races ahead. According to this view, advances in science and technology create successive opportunities to modernize forces that governments ignore at their peril. Churchill's chief scientific advisor during the Second World War, Lord Solly Zuckerman, made the case for the technological-imperative model when he argued that 'at base, the momentum of the arms race is undoubtedly fuelled by the technicians in governmental laboratories and in the industries which produce the armaments.'[27] The political scientist Marek Thee likewise saw 'an intricate circular relationship of mutual stimulation between the technological momentum and the working of military R&D, on the one hand, and the great-power armaments competition on the other. We should note the close interaction in stimulating the arms race between the feats of military technology, the interests and preferences of the military, the doings of the military industry and of the state

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[26] Barry Buzan, *Introduction to Strategic Studies: Military Technology and International Relations* (New York, 1987), 76–113. In his revised work, *The Arms Dynamic in World Politics* (London, 1998), 79–81, written with Eric Herring, Buzan confines the discussion to two main arms-dynamics models: 'action-reaction' and 'domestic structure', counting 'the technological imperative' as part of the domestic structure model; this may have been from the authors' desire to avoid a 'narrow weapon systems or bombs-and-bullets hardware approach' to the subject (p. 1).

[27] Solly Zuckerman, *Nuclear Illusion and Reality* (London, 1982), 103.

political bureaucracy.'[28] Although such views may be exaggerated and suggestive of a crude technological determinism, rapid advances in military technology certainly do exert an influence on weapons procurement decisions. Real or perceived shifts in the balance of advantage between offensive and defensive warfare, caused by technological breakthroughs, may heighten tensions between states and encourage the rapid accumulation of arms.[29]

The second explanatory model places primacy on the domestic political causes of arming, and has its origins in the radical nineteenth-century critiques of capitalism, militarism, and authoritarianism. For example, the Marxist theoretician Karl Kautsky argued that capitalism needed a way to expend surplus production, and 'a very effective way of doing this is by the arms race on land and sea'.[30] Radical thinkers also saw arming as a form of social control. By whipping up fear of foreign threats and by arming against them, so ran the argument, authoritarian regimes and the big business elites that stood behind them manufactured unity at home and resisted democratization. In the 1920s the German historian Eckart Kehr applied this model of how business, the military, and political elites combine to explain why imperial Germany entered a battleship-building race against Britain before the First World War.[31] The idea that certain types of domestic order are more prone to arm excessively than are others remains an enduring theme in the literature, but the domestic model has expanded since 1945 to include a range of internal imperatives that sociologists such as Harold Lasswell and C. Wright Mills regarded as general symptoms of modernity, such as the institutionalization of armaments production, military budgeting processes, the organizational politics of armed forces, nationalist, military and corporate lobby groups, electoral politics, and of course the 'military-industrial complex'.[32]

The third model is the action-reaction cycle, which in contrast places primacy on external factors. According to this 'common sense' view of how arms races function, country A expands its armaments chiefly in response to armaments expansion by country B, for reasons that may have been prompted by diplomatic crises or by realignments in a perilous and uncertain international environment. Country B then responds to A, prompting A and other countries to reply in turn.

[28] Marek Thee, 'Military Technology – A Driving Force Behind the Arms Race and an Impediment to Arms Control and Disarmament', in Hans Günter Brauch, ed., *Military Technology, Armaments Dynamics and Disarmament* (New York, 1989), 42.
[29] Michael E. Brown, Owen R. Coté Jr, Sean M. Lynn-Jones, and Steven E. Miller, eds., *Offense, Defense, and War* (Cambridge MA, 2004).
[30] Stargardt, *Militarism*, 115.
[31] Eckart Kehr, *Economic Interest, Militarism, and Foreign Policy: Essays in German History* (Los Angeles, 1970).
[32] Harold D. Lasswell, 'The Garrison State', *American Journal of Sociology* 46/4 (1941), 455–68; C. Wright Mills, *The Power Elite* (reprint of 1956 edn., New York, 2000). For examples of the domestic model applied to the US during the Cold War, see Benjamin O. Fordham, *Building the Cold War Consensus: The Political Economy of U.S. National Security Policy, 1949–51* (Ann Arbor Michigan, 1998); and for the politics of arms procurement, see Theo Farrell, *Weapons without a Cause: Politics of Weapons Acquisition in the United States* (Basingstoke, 1996).

The competitors thus become locked into a reciprocal and self-reinforcing cycle of arming and counter-arming that either peters out or results in war. As previously noted, Lord Grey described the pre-1914 arms race in these terms, and the theory of action-reaction cycles has had many other authoritative adherents. In 1967, for example, US Secretary of Defense Robert McNamara wrote in striking language: 'Whatever their intentions or our intentions, actions—or even realistically potential actions—on either side relating to the buildup of nuclear forces necessarily trigger reactions on the other side. It is precisely this action-reaction phenomenon that fuels the arms race.'[33] Implicit in the action-reaction approach is the concept of the 'security dilemma'. As a state increases its own security, it may decrease that of others, inviting them to respond.[34] Arms races are therefore the epitome of a double tragedy: the anarchic nature of international politics condemns states to seek safety in arms, but the security dilemma prevents them from ever achieving it.[35]

Obviously these three models are not mutually exclusive. It is important, moreover, to distinguish between the reasons why arms races might begin in the first place and the internal and external mechanisms that sustain them once they have started. One of the advantages of a multi-authored volume is that it can highlight how the balance between the roles of the explanatory models has shifted over time and in different places. For this reason, the chapters that follow are arranged in four parts: Part I looks at arms races before 1914, Part II covers the inter-war years, Part III focuses on the Cold War between the two superpowers and in Europe, and Part IV looks at extra-European rivalries and the post-Cold War period. In the first two parts the editors have adopted an analytical distinction between naval, land, and (later) air armaments races, which more or less corresponds with the policy debates at the time. In the latter two parts they have adopted more of a geographical organization, dividing 1945–91 into the three sub-topics of the Soviet Union, the United States, and the non-superpower countries. Attention then turns in Part IV to armaments developments since the Cold War and to regional flash points in the Middle East, South Asia, and East Asia. The editors have also provided brief overviews to introduce each section. We have not compiled a general bibliography for this volume, but instead encouraged our contributors to reference the relevant literature on their topics in their footnotes to provide a starting point for further reading. While the chapters provide case studies of the major historical examples of arms races, the overviews complement them by referring to other instances of the phenomenon and by providing a broader international political context. We believe that the chapters and the overviews in this volume offer the first connected

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[33] Charles L. Glaser, 'The Causes and Consequences of Arms Races', *Annual Review of Political Science*, 3 (2000), 251–76.

[34] Ken Booth and Nicholas Wheeler, *The Security Dilemma: Fear, Cooperation, and Trust in World Politics* (Basingstoke, 2008).

[35] Cf. Robert Jervis, 'Cooperation under the Security Dilemma', *World Politics*, 30 (1978), 167–214.

historical survey of the modern arms race phenomenon in its totality, based on the latest analysis and research. We hope the book will stimulate further investigation, and provide both theoreticians and practitioners with an indispensable foundation. Its theme is both dramatic and of continuing—in fact of heightening—relevance.

Map 1. Europe in 1914

PART I

BEFORE 1914

Introduction

David Stevenson

The first question is where to start. Competitive arming may be seen already in the fifth century BC, when Athens' fortification construction alarmed its rivals during the run-up to the Peloponnesian War.[1] During the First Punic War, Rome built a fleet that challenged and surpassed that of Carthage. More than a millennium later, between AD 1465 and 1477, France and Burgundy competed for the best mobile siege guns,[2] and at the time of the defeat of the Armada in 1588, England and Spain vied in warship construction.[3] In the eighteenth century Britain and France did likewise, and in 1748 the Baron Charles de Montesquieu lamented that 'a new disease has spread across Europe; it has smitten our rulers and makes them keep up an exorbitant number of troops. The disease has its paroxysms and necessarily becomes contagious, for as soon as any one power increases its forces, the others immediately increase theirs, so that nobody gains anything by it except common ruin.'[4] Even so, the late-eighteenth and early-nineteenth centuries also witnessed some of the first attempts at internationally agreed restraint, including a 1787 Anglo-French understanding to limit naval arms increases, and the 1817 Rush–Bagot agreement to demilitarize the Great Lakes.[5]

None the less, most surveys of arms racing highlight the mid-nineteenth century as witnessing the birth of the modern phenomenon,[6] the most obvious reason being the acceleration of technological change. For two centuries before the 1830s, the

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[1] Thucydides, *The Peloponnesian War* ed. by P. J. Rhodes (Oxford, 2009), 44ff.

[2] William H. McNeill, *The Pursuit of Power: Technology, Armed Force, and Society since A.D. 1000* (Oxford, 1983), 87–8.

[3] Cf. Colin Martin and Geoffrey Parker, *The Spanish Armada* (revised edn., Manchester, 1999), chapter 2.

[4] From Montesquieu, *The Spirit of the Laws*, cited in Grant T. Hammond, *Plowshares into Swords: Arms Races in International Politics 1840–1991* (Columbia SC, 1993), 103.

[5] Scott A. Keefer, 'Great Britain and Naval Arms Control: International Law and Security 1898–1914' (PhD thesis, London School of Economics & Political Science, 2011), 18–30.

[6] Samuel P. Huntington, 'Arms Races: Prerequisites and Results', *Public Policy* 8 (1958), 41–86; Hammond, *Plowshares into Swords*, 4.

design of warships and of small arms and artillery had altered little.[7] But since that time weapons technology has been in continuous evolution, and most armaments rivalries have included a qualitative element, of competition for the best available system, as well as a quantitative drive to amass as much *matériel* as possible. But even the quantitative element grew more dynamic as the Industrial Revolution fanned outwards from the British Isles across Europe, North America, and East Asia; and from its origins in textiles and iron founding to metallurgy, chemicals, engineering, and shipbuilding. The arrival of mass armaments production is often dated to the emergence in the 1820s of the Connecticut Valley system of machining interchangeable parts for small-arms manufacture, but during the Crimean War Henry Bessemer achieved a breakthrough towards mass production of cheap steel, which Armstrong and Krupp exploited in order to develop armour plate for warships and steel breech-loading cannon for both navies and armies.[8] And with the patenting from the 1880s of high explosives, the way was open for still more radical change.

The nineteenth century's inventiveness was not just technological: it was also organizational. Traditionally military and naval production had been concentrated in state arsenals and dockyards. But from the mid-century private armaments manufacturers, normally iron and steel producers in origin, arose alongside them. Their technical capacities complemented and even exceeded those of the government establishments, and they represented a reservoir of extra capacity. Yet they could not survive just on domestic orders, and a further novelty was the private export of armaments, by modern standards surprisingly unregulated, which disseminated technological advances to flashpoints such as Latin America, the Balkans, and East Asia. As public opinion broadened in parallel, navy leagues and patriotic societies demanded higher spending and military readiness; whereas socialist and pacifist movements lobbied for arms control. Finally, armed forces themselves, like other aspects of the state machinery, became more bureaucratic and professionalized. Between 1815 and 1914 there was no general conflict involving all the Great Powers of the day, and such inter-state wars as did occur were mostly brief. But increasingly, even in peacetime, military organizations were systematically preparing for hostilities. Much of this activity centred on general staffs, the Prussian model being copied with variations by other countries and extended to navies as well as armies. Into the staffs flowed reports from attachés and from intelligence services; based on this and other information, staff officers drew up and revised their mobilization and concentration schedules, testing them in war games and manoeuvres and updating doctrinal regulations and training programmes. Weapons development and procurement formed parts of a broader planning process, as a deterrent against war but also as a precaution should peace break down.[9]

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[7] McNeill, *Pursuit of Power*, 225–32.   [8] *Ibid.,* 237–8.
[9] For overviews, William McElwee, *The Art of War: Waterloo to Mons* (Indiana University Press, 1974), chapter 4; John Gooch, *Armies in Europe* (London, 1980), chs. 4–5; Geoffrey Wawro, *Warfare and Society in Europe, 1792–1914* (London, 1999), chs. 3–5.

As the nineteenth century progressed, armaments competition diffused across the globe, encouraged by the spread of industrialization and by exports. This process will be surveyed here through three sub-periods: *c.* 1840–70, 1870–1900, and 1900–14.

The earliest example of an armaments rivalry in which technological innovation played a major role was the Anglo-French naval competition between the 1840s and the 1860s.[10] Like other and later long-lived contests (such as the US–Soviet rivalry after 1945), it went through phases of greater and less intensity; including one in the 1850s when the two protagonists actually fought as allies against Russia. It is therefore preferable to break down the rivalry (which had pre-1815 antecedents and would re-emerge after 1870) into a series of discrete episodes, as did the English Radical Richard Cobden in one of the earliest analyses of the arms-racing phenomenon.[11] Britain and France both had constitutional political systems that differentiated them from governments further east, but centuries-old hostility divided them, whose memory the Revolutionary and Napoleonic Wars exacerbated. They also had more immediately conflicting interests in the Mediterranean and elsewhere. For two decades after 1815 the Admiralty in London had not been particularly concerned about the French Navy,[12] but a galvanizing incident—the Mehemet Ali Middle Eastern crisis of 1839–40—changed this perception, and in 1847 the Duke of Wellington (among others) warned that now the French could use new steam-powered vessels to throw an army across the English Channel at a moment of their choosing.[13] The most acute phase of the rivalry coincided with Louis Napoleon Bonaparte's (soon crowned Emperor Napoleon III) first decade in power, and with the transitions in warship design from sail to steam propulsion and from wood to steel hulls, the French taking the lead in both cases. In 1850 they launched the *Napoléon*, which could steam at the then remarkable speed of 13 knots, although the British quickly developed counterparts. The most serious scare on the British side, however, followed Napoleon III's incursion into Italy in the war of 1859, which it was feared might presage a new attempt to redraw the map of Europe.[14] And in the same year the French launched an ironclad vessel, the *Gloire*, equipped with 12-inch armour plate, though the British soon responded with the *Warrior* (commissioned in 1861), which was faster, more heavily armoured, and carried more powerful guns.[15] In truth, despite the periodic alerts in the London media, the British maintained their numerical advantage throughout, and also (contrary to French expectation) had less difficulty in recruiting personnel. They had a deeper purse and a much bigger iron industry. The competition was already slackening off before Prussia's shock defeat of Austria in the Seven Weeks War of 1866 forced Napoleon III to concentrate on his army.

[10] C. I. Hamilton, *Anglo-French Naval Rivalry, 1840–1870* (Oxford, 1993) is the standard account.

[11] Richard Cobden, *The Three Panics: an Historical Episode* (London, 1862).

[12] Christopher J. Bartlett, *Great Britain and Sea Power 1815–1853* (Oxford, 1963), 28.

[13] Hamilton, *Anglo-French Naval Rivalry*, 19–20.

[14] Austria triggered the war with a demand that Piedmont should disarm, Alan J. P. Taylor, *The Struggle for Mastery in Europe, 1848–1918* (reprinted London, 1973), 110–12.

[15] Hamilton, *Anglo-French Naval Rivalry*, chapter 2; McNeill, *Pursuit of Power*, 227.

For forty years after 1815 the Russian Army had been the largest on the Continent, available as a back-up should Prussia or Austria again be challenged by internal revolution or by French revanchism. But by the 1840s nationalist forces were gaining impetus in Italy and Germany, and the governments of Piedmont and Prussia were increasingly tempted to ride with them, jettisoning conservative solidarity. Russia's defeat in the Crimean War, following Austria's threat to intervene on France and Britain's side against it, created a more fluid political constellation, at the same time as technological innovation destabilized the strategic balance. The replacement of the smooth-bore musket by the breech-loading infantry rifle, initiated with the Prussian needle gun, marked the first step; but rifled, steel, breech-loading artillery followed it, while the spread of railways promised to speed up mobilization and concentration. In all of these areas the Prussians took the lead.[16] Their victory over Austria in 1866, followed by the formation of the North German Confederation, opened one of the first modern land arms races, in which the Germans learned the lessons of 1866 (particularly the need to improve their artillery), while the French introduced the chassepot rifle and the *mitrailleuse* (an early machine gun), and tried belatedly to expand their reserve of trained manpower, while both governments clashed repeatedly over the Low Countries and the Rhineland. By 1870 both were seeking an opportunity to resort to force, and military developments meant that both (though the French mistakenly) judged the moment propitious.

During the 1870s the pace of continental military activity remained permanently higher. Germany's victories encouraged efforts across Europe to adopt its general staff, war planning, and mass conscription systems, and both Germany and France invested in frontier-fortress building and strategic-railway construction. In 1879 Germany and Austria-Hungary (as the Habsburg Monarchy should be referred to after 1867), concluded a secret long-term defensive alliance, the two empires joining with Italy in the Triple Alliance of 1882. Austria-Hungary and Russia fortified and garrisoned their Polish borderlands against each other, although Russia still co-operated with Germany and Austria-Hungary through a variety of security arrangements until its secret Reinsurance Treaty with Germany was allowed to lapse in 1890, opening the way for France and Russia to form an alliance in 1891–4. While these diplomatic realignments proceeded, during the later 1880s and early 1890s, both continental blocs stepped up their army recruitment, and equipped their infantry with magazine rifles. High-explosive shells threatened to make existing fortifications obsolete, and led, after a pause, to new rounds of redesigned fortress building.

The heightened competition of the 1880s and 1890s, however, settled down at a greater level of preparedness, with the German–Austrian bloc still stronger than the Franco-Russian one. This outcome was due partly to a renewed naval race, between Britain on the one hand and France and Russia on the other.[17] Like its

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[16] *See* Chapter 1.
[17] The classic account remains Arthur J. Marder, *The Anatomy of British Sea Power: A History of British Naval Policy in the Pre-Dreadnought Era, 1880–1905* (London, reprinted 1964).

predecessor, this contest spanned two decades, and its intensity ebbed and flowed. It followed a lull during the 1870s when both France and Britain had neglected their fleets. Although the British particularly feared a Franco-Russian combination against their Mediterranean lines of communication, frictions between the three countries ranged more widely: from North Africa to Central and East Asia. Capital-ship design continued to evolve, with quick-firing guns and destroyers being introduced to ward off torpedo boats, although the changes were less dramatic than previously.[18] Once again—assisted by lower interest rates on government debt, though even so with increasing strain—the British maintained their numerical lead, a principle embodied in the 'two-power standard' (of at least equalling the next two largest fleets put together) that underlay the 1889 Naval Defence Act and London's big construction budgets during the 1890s. In 1902–3 the French Navy, under the administration of the Radical Navy Minister Camille Pelletan, lapsed into decline, while in 1904–5 the Japanese all but annihilated Russia's Pacific and Baltic Fleets. These developments ended a second two decades of naval rivalry, and once again the British had out-spent their rivals, though this time their dominance over the world's oceans was compromised and in American and East Asian waters they had to scale down their naval presence.[19]

The Russo-Japanese War had been preceded by an arms race in East Asia.[20] This race in turn had been precipitated by the 1894–5 Sino-Japanese War and the Russo-Franco-German 'Triple Intervention' that forced Japan to relinquish some of its gains, and had been encouraged by events in 1897–1901 that seemed to presage a partition of China. The Japanese expanded and re-equipped their armed forces, ordering their warships primarily from Britain and their artillery from Krupp, whereas Russia's construction of its Trans-Siberian Railway and reinforcement of its bases at Port Arthur and Vladivostok was more desultory. East Asia between 1894 and 1904 was one of the earliest examples of a modern technological armaments competition outside Europe; and one that was strikingly asymmetrical. Whereas the Russians were less focused on the contest, Japanese motivations extended beyond deterrence to using arms modernization in order to reverse the military balance and as a springboard for attack.

East Asia was not the only extra-European theatre. In nineteenth-century Latin America the newly independent states fought major wars against each other and competed in armaments. During the 1870s and 1880s Argentina overtook Brazil as the largest naval power. But in 1879–83 Chile defeated Bolivia and Peru in the War of the Pacific, and took delivery of a powerful new cruiser, the *Esmeralda*, from Armstrong's. Argentina and Chile disagreed over their Andean border, and vied for leadership of the southern cone. From 1888 Argentina built up its forces against Chile both on land and at sea, and Chile responded: both countries ordering

[18] *Ibid.*; and Karl Lautenschläger, 'Technology and the Evolution of Naval Warfare', *International Security* 8/2 (1983), 12ff.

[19] Aaron L. Friedberg, *The Weary Titan: Britain and the Experience of Relative Decline, 1895–1905* (Princeton, NJ, 1988), chapter 4.

[20] Hammond, *Plowshares into Swords*, 92–9; Jonathan A. Grant, *Rulers, Guns, and Money: the Global Arms Trade in the Age of Imperialism* (London, 2007), 134–43.

their army equipment primarily from Germany and their warships in Britain. By 1902, when both (but especially Chile) were feeling the financial strain and about to enter on a still more costly round of purchases, Britain could mediate an agreement that froze new orders for capital ships and required both sides to reduce their fleets. As in Europe a decade earlier—and in contrast to East Asia–the implication was that arms races did not necessarily lead to war, and could terminate through financial exhaustion. Perhaps such an outcome was easier in contests—resembling those after 1945 in the Middle East and South Asia—where the antagonists were importing their most advanced weaponry and had to pay for it in foreign exchange. Argentine-Chilean rivalry did not end, however, and would soon re-emerge.[21]

The final period to consider is that after 1900 (see Figure I.1). Its two outstanding armaments rivalries are discussed below in Chapter 1 and Chapter 2. The Anglo-German naval race was initiated on the German side with the Navy Laws of 1898 and 1900, which were precipitated once again by a diplomatic crisis (the Germans' perceived humiliation in the Kruger Telegram affair of 1895–6), and intended in the first instance to forge an instrument of political leverage rather than a war-fighting arm. Their anti-British purpose remained unavowed. Not until 1902 did the Admiralty and the British public acknowledge Germany's hostile intent, and their awareness of the new antagonist sharpened as the challenges from France and Russia lessened. The rivalry reached its climax after HMS *Dreadnought*—which outclassed all existing capital ships—was launched in 1906 and the Germans responded in kind, and after 1912 it subsided with British superiority again upheld, albeit at higher expense than ever, and with the two-power standard de facto abandoned. Matthew S. Seligmann's chapter shows that the British prevailed in part because they changed the terms of the contest, competing not just in capital-ship numbers but also in combat readiness and in technological innovation of all kinds. First Sea Lord Admiral Sir John Fisher had served on HMS *Warrior*, and remembered the earlier Anglo-French contest. After the *Rüstungswende*, or 'armaments turning point', in the winter of 1911–12, Berlin reordered its priorities. German capital-ship construction dropped back from four to two vessels being laid down each year, whereas the army experienced its first substantial manpower increase in two decades. In the final pre-war years a land arms race between the Austro-German and Franco-Russian blocs came to dominate the European military scene, whereas the Anglo-German naval race stabilized. Chapter 2 argues that the land race was more quantitative and manpower-centred than was its naval counterpart and new technologies less prominent in it. Instead, external factors—particularly Russia's recovery from its East Asian defeat, and a string of Mediterranean and Balkan crises—drove the competition forward, and so far from losing impetus it was entering on a new and even costlier phase of spending on equipment (such as railways, fortresses, and artillery) in addition to manpower, on the eve of war.[22]

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[21] *Ibid.*, 117–34; Keefer, 'Great Britain and Naval Arms Control', chapter 4.
[22] For fuller discussion, *see* Chapter 2.
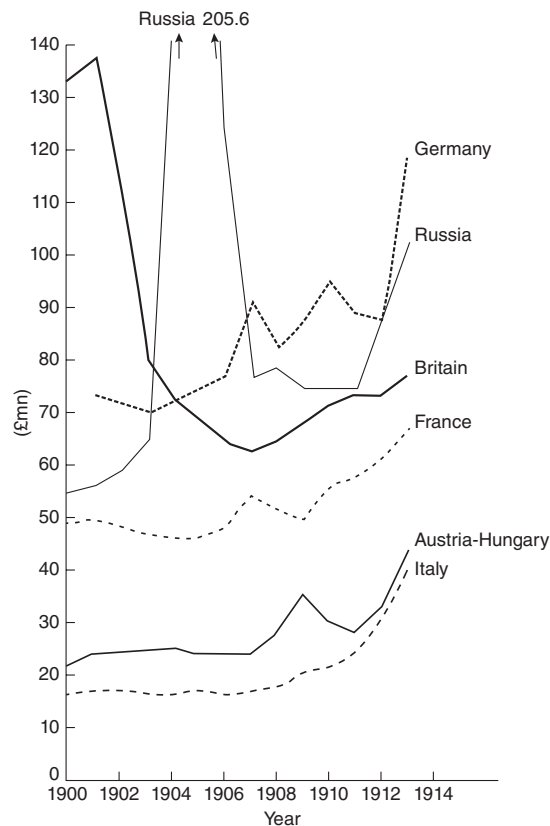
Defence expenditure of the European Powers, 1900–1913 in current prices (mn of each currency)

	Britain (£)	France (fr)	Russia (rbl)	Austria-Hungary (kr)	Germany (mk)	Italy (li)
1900	121.0	1,114	420.1	410.3	—	356.0
1901	123.3	1,126	427.7	439.3	1,162.9	372.3
1902	100.6	1,080	443.6	455.4	1,122.8	373.3
1903	72.2	1,042	464.9	464.0	1,105.7	361.6
1904	66.0	1,033	1,162.2	478.3	1,152.2	362.1
1905	62.2	1,030	1,632.1	481.1	1,233.5	377.4
1906	59.2	1,087	1,032.9	488.4	1,358.2	374.3
1907	58.5	1,245	679.1	507.2	1,631.1	404.9
1908	59.0	1,194	673.8	597.9	1,463.7	422.4
1909	63.0	1,147	647.9	759.6	1,593.6	467.4
1910	67.8	1,301	650.4	681.9	1,771.3	498.5
1911	70.5	1,412	671.3	657.8	1,707.5	577.3
1912	72.5	1,493	814.8	780.9	1,781.3	754.7
1913	77.2	1,630	9616	1,030.9	2,406.4	999.7

Notes: British and German figures are for the years ending 31 Mar. 1914; the Italian for those ending 30 June 1913; figures for Austria-Hungary, France, and Italy are for calendar years.

Figure I.1. Defence Expenditure of the European Great Powers, 1900–1913

Source: Stevenson, *Armaments and the Coming of War*, p. 2.

Alongside the Anglo-German naval race and the inter-block land race a multitude of smaller rivalries developed. A subsidiary contest—both maritime and terrestrial—pitted Austria-Hungary against Italy between 1904 and 1912, although on paper the two remained allies. It began with a war scare and took the form first of pre-dreadnought and then of dreadnought rivalry in the Adriatic (both sides building their own ships), as well as army modernization and fortification in the Trentino. It was suspended after 1912 when the expense of conquering Libya overstrained Italy's military budget, while Austria-Hungary redirected its attention to the Balkans and to Poland.[23] Since a coup in 1903 had brought to power an anti-Austrian ruler in Belgrade, another subsidiary arms race had developed between Austria-Hungary and its South Slav neighbours of Serbia and Montenegro, featuring artillery modernization and railway building (assisted by French sales and credits) on the Serbian side and frontier reinforcement on the Austrian.[24] Nor was this the only rivalry in the region. Although Russia largely suspended its rivalry with Japan after 1905, it built up its Black Sea Fleet against Ottoman Turkey, but in 1914 the Ottomans were about to take delivery of two dreadnought battleships from Britain, which would tilt the balance radically in their favour. The Turks also engaged in naval rivalry against Greece, which had gone to war with them in 1897 and 1912–13, and had gained the edge by purchasing a modern cruiser, the *Averoff*, from Italy. In spring 1914 a Greco-Turkish war over the Aegean was being widely predicted, and in May the Greeks bought two older American battleships to offset the impending dreadnought deliveries to their rival.[25] Finally, in the western hemisphere another dreadnought race developed after Brazil ordered three new battleships from Britain in 1906. The Argentineans responded by ordering two, also from Britain, and Chile ordered two from the US. The motives seem partly to have been prestige and partly to support diplomacy in Brazil's territorial disputes, but the Brazilians soon ran into financial difficulties, and their sailors mutinied for better conditions. After the death of their Foreign Minister, Baron do Rio Branco, in 1912 they cancelled the third ship, which was still under construction and was sold on to Turkey. Once Brazil slowed down, Argentina followed; suggesting that the impetus behind the race came in considerable measure from personalities rather than more fundamental antagonisms.[26]

Yet even as the South American rivalry lost momentum, those in the Aegean and the Black Sea acquired new urgency, and a feature of the pre-1914 years was 'a great preponderance of loose dreadnoughts', as Winston Churchill, First Lord of the Admiralty from 1911, described it.[27] The new technology was also diffusing into the Pacific. Since the 1880s the United States had been modernizing and expanding its navy, at first with no particular adversary in mind. But after 1905 the

[23] David Stevenson, *Armaments and the Coming of War: Europe, 1904–1914* (Oxford, 1996), 83–6, 133–6, 225–9.

[24] *Ibid.*, pp. 131–2; Balkan arms sales generally are discussed in Raymond Poidevin, *Les Relations économiques et financières entre la France et l'Allemagne de 1898 à 1914* (Paris, 1969).

[25] Grant, *Rulers, Guns, and Money*, 169–85.   [26] *Ibid.*, 146–69.

[27] Churchill to Grey, 24 October 1913, in George P. Gooch and Harold V. Temperley, eds., *British Documents on the Origins of the War, 1898–1914*, 11 vols. (London, 1928–36), Vol. X (ii), doc. 487.

Japanese too were building modern battleships, and recurrent war scares dogged the two countries' relations.[28] The preconditions were being established for the Japanese–American naval contest that, albeit temporarily, the Washington naval treaties of 1921–2 would contain.[29] Indeed, arms limitation would become a standard feature of war aims declarations (including American President Woodrow Wilson's Fourteen Points) in 1914–18, but before the war the success of arms control between Chile and Argentina had little counterpart elsewhere. The 1856 Treaty of Paris imposed unilateral disarmament on Russia in the Black Sea, but the Russians seized the Franco-Prussian War as an opportunity to denounce the regime, and at the 1871 London Conference the other powers ratified this outcome. On the eve of the Franco-Prussian War itself, Britain suggested mutual disarmament, but Bismarck resisted.[30] In proposing what became the First Hague Peace Conference of 1899, Tsar Nicholas II hoped to head off an expensive race in quick-firing field guns, but all he obtained was a resolution that arms limitation was desirable and governments should study it.[31] At the Second Hague Conference of 1907, the British tried to freeze warship building at a point that favoured them—or at least to pin the blame for a further construction round on Germany. They won no support, partly because American President Theodore Roosevelt was worried about the Japanese, and the conference merely reiterated that 'it is highly desirable that the Governments should resume the serious study of this question'.[32] Similarly, Winston Churchill's 1913 proposal for a one-year naval construction freeze or 'holiday' suited Britain but neither Germany nor France and Russia. It led nowhere, even though London and Berlin were tacitly settling into mutual acceptance of a 3:2 ratio in capital ships.[33] By 1914 the spread of modern technology had created an interconnected system of armaments competitions that arms control efforts failed to restrain, and that both reflected and exacerbated the inter-state antagonisms that would convulse global politics for the next three decades.

[28] William R. Braisted, *The United States Navy in the Pacific, 1897–1909* (Austin TX, 1958), chapter 5; Hammond, *Plowshares into Swords*, 132–36.

[29] See the Introduction to Part II.

[30] J. L. Herkless, 'Lord Clarendon's Attempt at Franco-Prussian Disarmament, January to March 1870', *The Historical Journal* 15/3 (1972), 455–70.

[31] Dan L. Morrill, 'Nicholas II and the Call for the First Hague Conference', *Journal of Modern History* 46/2 (1974), 296–313.

[32] Stevenson, *Armaments and the Coming of War*, 105–11.

[33] Richard Langhorne, 'The Naval Question in Anglo-German Relations, 1912–14', *The Historical Journal* 14/2 (1971), 359–70; John H. Maurer, 'Churchill's Naval Holiday: Arms Control and the Anglo-German Naval Race, 1912–1914', *Journal of Strategic Studies*, 15/1 (1992), 102–27.

1

The Anglo-German Naval Race, 1898–1914

Matthew S. Seligmann

In June 1897 Rear Admiral Alfred Tirpitz, the in-coming state secretary at Germany's Imperial Navy Office, tabled a memorandum arguing for a warship construction programme whose purpose was to enable his country to pit its maritime strength against that of the world's leading naval power, Great Britain: 'For Germany,' Tirpitz explained, 'the most dangerous naval enemy at the present time is England. It is also the enemy against which we most urgently require a certain measure of naval force as a political power factor.'[1] Although few then knew it, these words would soon inaugurate a fierce competition in naval armaments between Europe's two leading industrial and commercial powers, one that would poison relations between them and culminate a decade and a half later in war.

The origins of the 'Tirpitz Plan', as Germany's pre-First World War naval expansion has been dubbed, have long been debated. Some historians have stressed the role of key individuals. Top of the list for many comes Kaiser Wilhelm II, whose upbringing endowed him with both an admiration of the Royal Navy and a desire to emulate and surpass it. Eager to build up 'his navy', as he saw it, he provided the political foundations for naval expansion.[2] By contrast, other historians, while agreeing on the role of the individual, argue that the principal driver was not Kaiser Wilhelm II but Tirpitz, who was motivated by *Ressorteifer*, the desire to enhance the prestige of the navy in which he served and to build up the power and influence of the bureaucratic machine he led.[3] Alternative schools of thought have emerged that downplay individual actors and focus more on domestic political or foreign policy issues. The Kehrite school, for example, stresses the domestic roots of German naval expansion. According to their analysis, Germany at this time was an advanced industrial nation with a political system that privileged the place of pre-industrial elites. These elites were conscious of the challenge that modernity might present to their status and power and so sought strategies to buttress their

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[1] Jonathan Steinberg, *Yesterday's Deterrent: Tirpitz and the Birth of the German Battle Fleet* (New York, 1965).

[2] John C. G. Röhl, *Wilhelm II: the Kaiser's Personal Monarchy, 1888–1900* (Oxford, 2004), especially chapter 32.

[3] Patrick J. Kelly, *Tirpitz and the Imperial German Navy* (Bloomington, 2011).

position. For some, building a navy, a course that could appeal to the self-interest of the industrial middle class, while simultaneously whipping up the patriotism of German workers, seemed an excellent mechanism for validating the existing order through a process of 'negative integration'. Key industrial combines, such as Krupp, would campaign alongside specially formulated pressure groups, such as the Navy League, for a naval expansion programme that would be led by the old order and paid for in a way that would enhance the income and position of the regime's key supporters, the east-Elbian landed aristocracy (the Junkers). In this context, German navalism was a 'domestic political crisis strategy' more than anything else.[4] Finally, there are those historians who stress the importance of the new navy to German foreign policy. Following the debacle of misguided German efforts to expand the empire's influence in southern Africa in the early 1890s—attempts that culminated in the diplomatic catastrophe of the 'Kruger Telegram' affair and a crisis in Anglo-German relations—the German leadership decided that it needed to give some teeth to its proposed policy of enhancing Germany's global influence through *Weltpolitik*. The teeth in question consisted of a naval force that would make German views count in the eyes of other global powers, especially Britain. In this context, the navy was designed to give the Reich political leverage in world affairs. Faced with such a conglomeration of naval power, accommodating Germany rather than opposing her would become the preferred option of the other world powers.[5] Navigating these diverse interpretations is no simple task, as all have their merits. None can be excluded as considerations that played no part in German maritime expansion. However, in the present state of research there are grounds for arguing that the strategic value of the navy as a form of peacetime leverage in global political affairs was the most influential factor in the thinking of those who drove the Tirpitz Plan and for many of those who supported it.

Whatever its origins, given its catastrophic impact, it is hardly surprising that historians have long sought to understand the dynamics of what is sometimes referred to as 'the great naval race'.[6] The traditional picture is well established. As Paul Kennedy concluded many years ago in a devastating critique of German strategic thinking, not only was Tirpitz's goal always unattainable, but his preferred means of pursuing it and the rationale he advanced in support of it were also fundamentally unsound.[7] In Kennedy's analysis, this was an arms race that should not have taken place, where the challenger had no prospect of overtaking the leader, and where the only possible outcome was a humiliating defeat. Nothing has been written to date that would seriously undermine these conclusions.

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[4] Volker R. Berghahn, *Germany and the Approach of War in 1914* (New York, 1973); Eckart Kehr, *Economic Interest, Militarism and Foreign Policy* (Berkeley, 1977), especially chapter 4.

[5] Matthew S. Seligmann, *Rivalry in Southern Africa 1893–1899: The Transformation of German Colonial Policy* (Basingstoke, 1998).

[6] Peter Padfield, *The Great Naval Race: The Anglo-German Naval Rivalry, 1900–1914* (New York, 1974).

[7] Paul M. Kennedy, 'Strategic Aspects of the Anglo-German Naval Race', in P. M. Kennedy, ed., *Strategy and Diplomacy 1870–1945: Eight Studies* (London, 1983), 129–60. See also, Rolf Hobson, *Imperialism at Sea: Naval Strategic Thought, the Ideology of Sea Power and the Tirpitz Plan, 1875–1914* (Leiden, 2002).

Consequently, as has long been recognized, Tirpitz's naval expansion programme offers a masterclass in how not to devise, launch, or manage an armaments race. Laden with inbuilt rigidities, untested dogmatism, and questionable *a priori* assumptions, it contained the seeds of its own demise. Yet, while recognizing that Germany's decision to vie for influence through an ambitious weapons-acquisition policy was grounded in a series of seriously flawed assumptions, it should be acknowledged that these shortcomings did not of themselves guarantee the plan's failure. What made this certain was the British government's decision to recognize and accept Tirpitz's challenge and to undertake specific, direct, and determined measures to counter it. It will be on this response, which was to prove devastatingly successful, that this paper will focus. Particular emphasis will be placed on the means—tactical and technological—by which Britain achieved victory as well as on the reasons for the ease with which this victory occurred. It will conclude with an assessment of the dire consequences of the German failure. To ground all this, however, it is first necessary to understand why Tirpitz believed a contest was possible.

Tirpitz calculated his programme and hence his entire challenge to the Royal Navy on the basis that he could confine the competition between the British and German navies to just one metric, namely the number of battleships.[8] By restricting the arms race in this way, he anticipated being able to reduce the cost of competition to manageable proportions. The logic behind this assumption rested upon four discreet but mutually interlocking notions.

First, was the belief that, because of Britain's need to project power globally, the number of battleships needed to mount an effective challenge was lower than it might initially seem. Many British battleships were based on distant stations where they protected British imperial interests from rival colonial powers, and in Tirpitz's view this requirement was destined to be ongoing, meaning that these assets were unlikely ever to be recalled home. Thus, Germany could exercise an influence with her battle fleet out of all proportion to its absolute power because Britain could not muster in the relevant location the crushing superiority that the Royal Navy undoubtedly possessed.

Second, it was Tirpitz's belief that, although for operational reasons Germany needed to build cruisers and destroyers of comparable quality to those possessed by other powers, German battleships needed to be neither as capable nor as versatile as their British counterparts. Built for only one mission—exerting pressure on Britain—they were only required to operate in one theatre—the North Sea—and could thus be designed with this reductive assumption in mind. Thus, costly capabilities (such as extended range and high crew habitability) that were necessary on multi-role Royal Naval vessels, could be excluded from German vessels, with significant savings accruing as a result.

Third, although it would inevitably have been the case that a fleet designed with combat as its principal mission would make preparedness for battle a key objective,

[8] This is the logic of the original Tirpitz Memorandum of 1897, the full text of which is quoted in Steinberg, *Yesterday's Deterrent*, 208–23.

in a fleet designed *principally* for political purposes and with numbers of capital ships as the main source of leverage, this was not a priority. Hence, there was no need to maintain the German battle fleet in a state of continual combat readiness and, consequently, the personnel costs of the German battle fleet, already low due to the system of conscription that drafted most of the crews, were rendered even lower because the numbers of long-term specialist ratings needed for a fleet always prepared for battle were not required.

Finally, the core political function of the German battle fleet also permitted Tirpitz to downgrade the importance of some qualitative features in the ships he ordered. Particularly in the early stages of his programme, Tirpitz was content for Germany's battleships to be of lower displacement than their Royal Navy counterparts and to mount a main battery composed of guns of a smaller calibre.[9] While this decision undoubtedly reflected, at least in part, a well-deserved confidence in the ballistic properties of Krupp-manufactured heavy ordnance, as well as an appreciation of the potential advantages of more rapid fire—a property of these smaller weapons—the lower cost of lighter artillery was a key factor.

Given all of the above considerations, Tirpitz was convinced that in terms both of total numbers needed as well as individual unit costs, Germany would enjoy a significant competitive advantage over Britain if it concentrated on continuous capital ship building. Of course, were there to be radical changes in warship design, especially changes that increased size and cost, then these calculations would be thrown into doubt. However, the fact that battleship design had remained, various marginal and incremental improvements notwithstanding, relatively static in most essentials since the launch of the *Majestic* Class in 1894 suggested, to Tirpitz at least, that this assumption was a realistic one.

Unfortunately for Tirpitz, the Royal Navy, especially following the appointment in 1904 of Admiral Sir John Fisher as First Sea Lord, saw no reason to oblige the Germans by competing on only one metric, least of all on a metric that had been chosen by and was most convenient to their new challenger. On the contrary, Fisher brought to the arms race the certain conviction that if competition were to take place, then it should be conducted on the basis that was least helpful to the other side. For Fisher this meant an emphasis on two additional areas of competition.

The first of these was 'fighting efficiency': under his direction, the Royal Navy underwent a radical restructuring that had enhanced preparedness as its one essential aim. As he explained in his manifesto for reform, which, with characteristic lack of modesty, he entitled *Naval Necessities*, the purpose of the major organizational changes he advocated was 'Absolute Instant Readiness for War'.[10] Lest anyone fail to understand the importance of this object, this phrase was printed in double height characters with italics for additional emphasis. Why this particular concentration? For Fisher, attaining the highest possible state of preparedness was

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[9] Ivo N. Lambi, *The Navy and German Power Politics, 1862–1914* (London, 1984), 272.
[10] *Naval Necessities* I, p. 20. The National Archives, Kew, United Kingdom [hereafter TNA], ADM[iralty files] 116/3092.

undoubtedly a desirable goal in its own right, one worth achieving irrespective of the identity of Britain's main adversary; however, in focusing so clearly on one this particular outcome, Fisher would have been well aware, given Tirpitz's decision not to make combat readiness a key objective, that reaching peak fighting efficiency would confer huge advantages over Germany. Intelligence reports from Berlin regularly emphasized the structural weaknesses in war readiness that were the inevitable consequence of the German Navy's undoubtedly cheap, but nevertheless labour intensive system of providing trained personnel for its warships. In particular, the fact that the conscripted recruits, who formed the majority of crews, served for a total of only three years meant that at just the point when they had attained the requisite skills in seamanship to be really useful on board ship they were discharged back into civilian life and replaced *en masse* by new recruits devoid of nautical bearing. The result, as one British naval attaché reported, was that 'so great are the consequent number of changes of men that occur in the crews in October that there are many German Naval Officers who frankly state that their ships are not true fighting assets from October to February of each ensuing year and that their ships only attain their real value from May to October'.[11] It was, the same attaché explained on another occasion, a 'factor of inefficiency' that could 'never, under the conditions obtaining in Germany, be wholly removed'.[12]

The leadership of the German battle fleet not only shared this assessment, but actually took it a stage further. As they regularly complained, one of the direct outcomes of Tirpitz's policy priorities—especially the focus on *matériel* over personnel—was that it rendered the forces at their disposal ready for war a mere four months in every year.[13] It is little wonder, therefore, that when, in the wake of Fisher's reforms, Arthur Lee, the Civil Lord of the Admiralty, publicly paraded the Royal Navy's advantages in combat readiness by proclaiming that, in the event of an Anglo-German war, Britain 'would get its blow in first, before the other side had time to read in the papers that war had been declared', it caused such consternation in Germany.[14] Fear of a surprise attack—what Jonathan Steinberg has labelled the 'Copenhagen Complex'[15]—reflected an acute awareness that the Royal Navy had focused on maximizing the war preparedness of their fleet, whereas the German Navy had not. This was an aspect of the naval race that Britain was clearly winning.

The one (and, it should be added, only) time that the Royal Navy's confidence in its inherent superiority in war preparedness was shaken came in early 1912. At this juncture, Winston Churchill, the newly appointed First Lord of the

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[11] Dumas, Naval Attaché Report 9/08, 12 February 1908 in M. S. Seligmann, ed., *Naval Intelligence from Germany: The Reports of the British Naval Attachés in Berlin, 1906–1914* (Aldershot, 2007), 151.

[12] Dumas, Naval Attaché Report 34/08, 30 July 1908, in *Ibid.*, 180.

[13] Dirk Bönker, *Militarism in a Global Age: Naval Ambitions in Germany and the United States before World War I* (Ithaca NY, 2012), 286.

[14] Arthur J. Marder, *From the Dreadnought to Scapa Flow, I: The Road to War, 1904–1914* (Oxford, 1961), 111.

[15] Jonathan Steinberg, 'The Copenhagen Complex', *The Journal of Contemporary History* i (1966), 23–46.

Admiralty, was busily preparing a set of vote-pleasing measures designed to trim back the size of Britain's burgeoning naval estimates and so release funds back to the Treasury for social programmes. In so doing, he blithely ignored the rumours coming out of Berlin (and faithfully reported by Captain Hugh Watson, the British naval attaché there) that proposals were being drawn up by the Reich authorities to 'remedy' the deficiencies in the German short-service system and, by so doing, make 'the High Sea Fleet efficient all the year round'.[16] Churchill was, therefore, caught entirely unprepared when the details of the new German *Novelle*, a series of proposed amendments to the country's naval law, came into his hands in early February. The bombshell these contained was not the small increase in the number of battleships that it was proposed to add to the German construction schedule, an alteration that was both minor in extent and had, in any case, long been anticipated; rather it was the intention to improve the fighting power of the fleet through a dramatic addition in long-service naval personnel—15,000 extra officers and men—and a consequent enhancement of the number of ships kept in permanent active service. As Churchill informed his Cabinet colleagues:

> The main feature in the new law is the extraordinary increase in the striking force, of ships of all classes, immediately available throughout the year. Whereas we now reckon against 17 battleships, 4 battle cruisers, and 12 small cruisers in the active battle fleet, demobilised to a great extent during the winter months, we must in future prepare against 25, 12, and 18, which are not to be subject to anything like the same degree of temporary demobilisation.[17]

In short, as Churchill further explained, it was 'the increase of personnel and the increases in the vessels of all classes maintained in full commission' that made the new legislation a 'development of the very highest importance', as it effectively 'amounted to putting about four-fifths of the German Navy permanently on a war footing'.[18] It did not take a great leap of the imagination to conclude that this was a direct and troubling assault on what had hitherto been the Royal Navy's greatest advantage, its superior efficiency and higher state of general readiness.

This, of course, was exactly the intent of the German measures and reflected the fact that, after the fiasco of the Second Moroccan Crisis, the balance of power had started to shift in the German naval hierarchy. Tirpitz's emphasis on the political needs of the distance future, which had for so long carried the day, suddenly seemed less important than rectifying the immediate sense of vulnerability, just exposed by the recent war scare, entailed in having a fleet whose readiness was so clearly below that of its most likely adversary. The *Novelle*, thus, incorporated the demands of the fleet leadership, the so-called 'front', for a new emphasis on war preparedness as opposed to a simple increase in battleship numbers, which would have been Tirpitz's main preference.

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[16] Watson, Naval Attaché Report 34/11, 30 November 1911. Seligmann, *Naval Intelligence*, 344.
[17] Memorandum by Churchill, 14 February 1912. TNA, ADM 116/1294B.
[18] Churchill, 'Admiralty Memorandum on New German Naval Law', 9 March 1912. TNA, ADM 116/1294B.

The fear that the *Novelle* heralded a change in German naval policy spurred the British Admiralty into action. Churchill's putative budget-trimming measures were swiftly jettisoned and, as is well known, ways were found to keep ever more British vessels in full commission in home waters. However, much to the Admiralty's relief, the German challenge in war preparedness did not prove nearly as testing as had been feared. As events were to show, it was one thing to plan an increase in naval personnel, but it was quite another to bring this into effect, especially if the desired additional manpower was in specialist areas like petty officers, engineers, or higher technical ratings. As early as mid-1912, the Imperial Navy Office was forced to admit that the navy was so short of engineers and recruitment was so lagging behind that it would be years after Tirpitz's shipbuilding programme was completed before the fleet would have its full complement of these essential crewmen.[19] The British were well aware of this. A careful monitoring of the German press by the ever watchful Naval Intelligence Division revealed that, notwithstanding the provisions of the *Novelle*, the High Seas Fleet suffered from severe shortages in trained crews and was likely to do so for some time.[20] The result, as Churchill gleefully recorded, was to derail German efforts at increased readiness. There would, he noted while preparing the British naval estimates for 1914–15, be 'three less German ships in full commission […] than we expected', allowing the corresponding planned increases in the Royal Navy to be scaled back by the same proportion.[21] This not only represented a very welcome cost saving; it also underscored that the British advantage in war preparedness, which had momentarily seemed in jeopardy, remained perfectly secure.

The emphasis on enhanced readiness was not the only precept that Fisher brought to bear on the Anglo-German naval race; another of his doctrines concerned the importance of continuous one-upmanship when it came to the specifications and design capability of the navy's future warships, a process that Fisher referred to as 'plunging'. This stress on always going one better with the next generation of naval assets was, in fact, one of the admiral's longest held and most consistently maintained beliefs. He had informed Nathaniel Barnaby, the well-respected Director of Naval Construction, as early as January 1883 that 'there is no progress in uniformity'. The 'right' thing to do, he asserted, is 'to make each succeeding ironclad an improvement [on its predecessors] and as perfect as you can'.[22] Barnaby was sceptical. As Britain of all the sea-faring countries had made the greatest capital investment in its fighting fleet, it was the nation that would suffer both the greatest

[19] Holger H. Herwig, *'Luxury Fleet': The Imperial German Navy* (London, 1980), 90.

[20] War Staff, Intelligence Division, 'Germany: 1. Shortage of Engineers; 2. Warrant and Petty Officers', 26 February 1914, TNA, ADM 137/3849. *See also* 'Press Reports bearing on Shortage of Personnel (Chiefly Higher Ratings)', undated [internal evidence suggests April 1914] in Naval Historical Branch: Historical Section of the Naval Intelligence Department volume 540, 'Miscellaneous I', ff.190–1.

[21] Minute by Churchill, 17 February 1914. Admiralty Library, No.24 Store, HM Naval Base, Portsmouth: First Lord's Minutes, Third Series—December 1913 to June 1914.

[22] Fisher to Barnaby, 25 January 1883, in Arthur J. Marder, ed., *Fear God and Dread Nought: The Correspondence of Admiral of the Fleet Lord Fisher of Kilverstone* 3 vols. (London, 1952–9), i, p. 114.

financial write downs should any innovations cause existing assets to become obsolete and the greatest additional expense should those assets thereby need replacing. A steady reactive approach rather than an adventurous pro-active policy, therefore, seemed to him self-evidently preferable. Many agreed, with the result that prior to Fisher's assumption of the post of First Sea Lord, the British naval leadership had frequently been wary of, if not downright hostile to pushing the pace of change when it came to ship design.

Fisher, never one to be impressed by conventional wisdom, turned this analysis on its head: far from benefiting from a policy of impeding the progressive development of warship capabilities, he argued that it was profoundly in Britain's interests to see a continuous stream of year-on-year qualitative and/or technological improvements in this very sphere. The logic behind this seemingly counter-intuitive proposition rested on the enormous competitive advantage conferred on the Royal Navy by the sheer scale, productive power, and speed of construction of the nation's shipbuilding and marine engineering industries. Due to the depth of its manufacturing base in these areas, Britain could both turn out warships in greater numbers than any other country and also build those ships more rapidly than any other country. For Fisher this meant that, of all the naval powers, Britain was the only one that need not fear change. If increases in the size, speed, or combat power of new fighting vessels rendered existing ones obsolete, the Royal Navy, unlike its competitors, could always rely on the fact that the redundant ships could be replaced quickly and efficiently. While this might incur some expense, this disadvantage was more than offset by the fact that, in setting the pace of change, the Royal Navy gained the automatic pole position that came from being the first to innovate. As Fisher explained: 'The whole secret of Admiralty success is "plunging"— it stupefies foreign Admiralties. You get a great lead, and a stern chase to pick up is *Hell!*'[23] And that was not its only advantage. While it was certainly true that some older British warships would be rendered out-of-date by such 'plunging', the more crushing fact was that it was the very newest vessels in the fleets of Britain's rivals that would be afflicted by premature obsolescence. Again, Fisher summarized the situation:

> You see all your rivals' plans fully developed, their vessels started beyond recall, and then in each individual answer to each such rival vessel you plunge with a design that is 50 per cent better! knowing that your rapid shipbuilding and command of money will enable you to have your vessel fit to fight as soon if not sooner than the rival vessel.[24]

In short, because of Britain's unsurpassed naval-industrial complex, revolutionary escalations in warship design would disrupt the long-term planning of foreign powers far more significantly than they would add financial burdens to the Royal Navy, which as the agent of change would always be forewarned about forthcoming advances and would always, therefore, start with an advantageous lead in

[23] Fisher to Churchill, 30 December 1911, in R.S. Churchill, ed., *W.S. Churchill* (London, 1969), companion vol. ii, p. 1365.
[24] Fisher to Churchill, 13 February 1912, in Marder, *Fear God and Dread Nought*, ii, 431.

them. Consequently, for Fisher competitive technological one-upmanship was not to be feared; rather it was an asset positively to be embraced and utilized as much as possible in any arms race.

Given the strength of his belief in it, it is not surprising that Fisher's tenure as First Sea Lord began with the prime example, if not the very acme of plunging. HMS *Dreadnought*, the world's first all-big-gun single-calibre turbine-powered battleship, had been conceived by Fisher prior to his appointment. Indeed, the general specifications of the ship can be found in the Admiralty House papers, the advance blueprint for his manifesto *Naval Necessities*, which he drew up while Commander-in-Chief at Portsmouth.[25] Hence, it is little surprise that no sooner had he become the Royal Navy's professional head than he started putting this idea into practice. A Committee on Designs was promptly set up to oversee the finer details, and its report very quickly led to the laying down and rapid construction of this revolutionary vessel.

Bigger, faster, and more heavily armed than any previous warship, *Dreadnought* represented a major advance in the battleship type —a fact underscored by the new vessel's distinctive appearance, which seemed deliberately formulated to set it apart from its predecessors and thus emphasize, even accentuate, the break with the past. And yet for all the iconography surrounding this new wonder weapon—an iconography that caused all subsequent battleships to be referred to in reverential terms as 'dreadnoughts' and all the preceding classes to be casually dismissed as mere 'pre-dreadnoughts'—*Dreadnought's* elevated stature as the world's largest and most powerful warship would be retained for the very briefest of periods. The cause was further 'plunging'. It soon transpired that, alongside its many other remarkable attributes, among the most notable was that *Dreadnought* was not the culmination, but only the very first step in a process of escalating qualitative improvements. Thenceforth, Fisher ensured—both during the years of his own leadership and, courtesy of his enduring influence, in the years thereafter as well—that each new class of battleship was larger and more capable than its predecessor, a fact that can be readily charted in the ever greater displacement of these vessels.[26] Thus *Dreadnought* herself, although weighing in at over 2,000 tons more than the *Lord Nelson* of the preceding year's programme, a gain of nearly 13 per cent, was succeeded by the *Bellerophon* class, a group of three ships each of which was 476 tons heavier than the *Dreadnought*. Their successors, the three *St Vincents*, were themselves a further 1,100 tons heavier; the subsequent *Colossus* class then added 330 tons more; the *Orions*, which succeeded them, contributed an additional 2,470 tons; then came the *King George V* class, with a further 460 tons; they were followed by the *Iron Duke* class, which added yet another 3,140 tons; and finally there were the *Queen Elizabeths*, which added in excess of 6,000 tons more. In total, therefore, between *Dreadnought* and *Queen Elizabeth*—vessels separated by a mere eight years—the displacement of battleships rose by over 14,000 tons,

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[25] The key sections are 'The Fighting Characteristics of Vessels of War' and 'The Guns of the Battleship and Armoured Cruiser' in TNA, ADM 116/942.

[26] All figures from Ray A. Burt, *British Battleships of World War I* (Revised edition, Barnsley, 2012).

making the super dreadnoughts, as they were now referred to, of the *Queen Elizabeth* class almost 80 per cent heavier than the original *Dreadnought* and at least 100 per cent heavier than any pre-dreadnought. In this statistic, the sheer scale of Fisher's original vision of continuous escalation in design capability, subsequently adopted and carried forward by Churchill with Fisher's encouragement, becomes evident.

Naturally, 'plunging' on such a scale was not without financial implications. *Dreadnought* may have represented an increase of nearly 13 per cent in displacement over the *Lord Nelson*, but, at £1,783,883 compared to £1,540,939, the monetary increment was the even greater figure of 16 per cent. However, this paled into insignificance compared to the staggering additional cost of the *Queen Elizabeth*. While admittedly the most expensive ship in her class, her eye-watering price tag of £3,014,103 represented an increase over *Dreadnought* of almost 69 per cent and over *Lord Nelson* of nearly 96 per cent. Thus, while the Liberal politician David Lloyd George may have been justified in labelling *Dreadnought* a 'piece of wanton and profligate ostentation', ultimately the ship would prove bargain basement compared to its successors.[27]

With the unit cost of battleships spiralling upwards, the implications for new construction budgets were naturally considerable. Yet, in financial terms, this was merely one of the ways in which plunging added to the overall burden. Not only were ships increasing in price, but so too was the cost of the equipment they carried. One reason for this was the growing size and power of their weaponry, which pushed up the price of the associated expendables. *Dreadnought*, for example, fitted with a main armament of 12-inch guns and 18-inch torpedo tubes, fired shells that cost £52 each and torpedoes that were initially priced at £540 apiece. The switch to 13.5-inch guns in the super-dreadnoughts of the *Orion* class led to the introduction of ammunition costing £105 a round, an increase of 100 per cent. Meanwhile, the invention of the heater torpedo led to a rise in the price of the ordnance for all existing 18-inch tubes to £708, a 31 per cent increase; while the subsequent adoption of the 21-inch torpedo pushed this up still further to £992, for an additional increase of 40 per cent and a total increase of 84 per cent. Even greater was the escalation in the price of ammunition for secondary batteries. At the outset, most British dreadnoughts carried 4-inch guns for defence against torpedo craft. However, from the *Iron Duke* class onwards bigger 6-inch artillery was mounted. While the former fired a shell costing a little over £2 a shot, ammunition for the latter was over £7 a round, an increase of 338 per cent. Naturally the higher cost of heavier shells had implications across the budget. The amount required in the estimates for gunnery practice, for example, rose by 40 per cent across the period from 1904 to 1912.[28]

If existing equipment was becoming more expensive, the continuous advance of naval science, which Fisher enthusiastically embraced as part of the plunging

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[27] Herwig, *'Luxury Fleet'*, 56.
[28] 'Summary of the Draft Navy Estimates, 1913–14, together with an Explanation of some of the Principal Causes of Increase', printed 13 January 1913, TNA, ADM 116/3151.

process, was adding new types of expenditure all across the board. Aeronautics, for example, an item on which nothing at all was spent when Tirpitz first conceived his challenge, had become a major call on resources by the eve of the First World War. A total of £321,600 was allocated by the navy under this heading in 1913.[29] Another source of additional cost was the switch to oil fuel. A mere £3,614 was devoted to this commodity in the 1902–3 British Navy Estimates. By 1913 this had grown more than 200-fold to £770,000 and the projection was that by 1916 a staggering £1,750,000 would be needed for acquiring, transporting, and storing this new fuel type. As the bulk of the fleet continued to be coal-powered, there was no comensurate saving in coal to offset this. A similar situation prevailed with regard to wireless telegraphy, which, to use Churchill's words, was 'another new service rapidly developing'. While radio would prove an invaluable tool for naval warfare, wide-scale expenditure covering all points of the budgetary compass was necessary to facilitate its adoption. As the First Lord elaborated:

> its expense is increased by every improvement; and every year new classes of ships must be provided with installations, and better quality of installations, while on shore an extensive system of powerful stations is being constructed. A numerous and growing skilled personnel, expensively trained and paid at specialist rates, has had to be brought into existence for these purposes alone.[30]

And the catalogue of new and expensive developments continued. Fire control, for example, was another such growth area. While instruments for this were few and far between in 1898, a decade and a bit later a new dreadnought might require an extensive list of costly mechanical devices as part of its standard outfit. These included: gyroscopically controlled range-finders; gyro-compasses worked in conjunction with the range-finders; mechanical computers for calculating range, rate of change, and deflection data; Forbes speed logs; apparatus for transmitting range and deflection data such as the so-called 'follow the pointer' sight; director firing equipment; and Eversheds bearing indicators. Furthermore, fitting and working all this equipment required enlarged and improved conning towers, a costly addition to new designs and an expensive alteration to existing ones.

The upshot of all these plunging-related changes was the inexorable growth of the British navy estimates. These had stood at £36.8 million in 1904–5, the year in which Fisher became First Sea Lord. Although regarded as unsustainably high at the time—indeed, Fisher had been appointed because of his willingness to oversee their reduction—by 1913–14 this figure had risen to £48.7 million, an increase of over 32 per cent. Given that Britain had a government committed to reducing expenditure on the armed forces in order to free up resources for social programmes, this was a massive and unwelcome expansion. Nevertheless, the understandable opposition of Chancellor of the Exchequer, David Lloyd George,

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[29] Churchill and Seely, 'Expenditure on Aeronautics', no date [printed February 1914], TNA, ADM 116/3152.
[30] Churchill, 'Summary of Draft Navy Estimates 1913–14', 1 January 1913, TNA, ADM 116/3151.

notwithstanding, it was an affordable rise. The same could not be said for the im-
pact of plunging upon Germany. The *Dreadnought* revolution sent the price tag of
German battleships up from 24 million marks for the pre-dreadnought
Braunschweig class, launched in 1902–3, to 45 million marks for the *König* class,
the last German battleships to be completed in time for the start of the First World
War. Their successors, the *Bayern* class, large ships designed to match the *Queen
Elizabeths*, were each projected to require a staggering 50 million marks. This cost
explosion played havoc with Tirpitz's carefully formulated plans. Between 1905
and 1914, the effort to keep pace with the Royal Navy sent the German naval
budget up from 233.4 million marks to 478.9 million marks.[31] This 105 per cent
rise in only nine years—much bigger than Britain's 32 per cent increase, due to the
fact that the qualitative increase from Germany's much weaker pre-dreadnoughts
to dreadnought standard was so much greater than was the case for Britain—was
financially ruinous for the Reich, which did not possess the tax base to sustain it,
and lent weight to Fisher's contention that the imposition imposed by plunging on
Britain would be as nothing compared to the difficulties bestowed on Britain's
rivals.

   Given the massive escalation in costs, which threatened to put a spoke in Tirpitz's
single-metric competition plans, it is not surprising that the Germans were ever
eager to reduce, or preferably eliminate, this element of the arms race. If the British
could only be persuaded to reduce the size or gun calibre of their warships it would
be a 'victory […] without firing any shot' and 'a blessing', noted the Kaiser.[32]
Accordingly, informal feelers on this topic were occasionally put out through the
press. In February 1914, for example, an article appeared in the *Berliner Tageblatt*
arguing that, as it was impossible to reach an arms control agreement on the basis
of the numbers of ships, the only solution was one based upon reducing dis-
placements. Germany, it stated, 'would be quite ready to reduce displacements if
England leads the way'.[33] The message was as clear as it was futile. With 'plunging'
a key component in Britain's strategy for winning the naval race, it is hardly to be
wondered that all such attempts to keep qualitative competition to a minimum
were fiercely resisted. When, for example, in 1908 Tirpitz made enquiries through
a back channel to see if Britain 'would agree to limiting the size of guns and size of
ships', Fisher dispatched a forthright rejection: 'Tell him I'll see him d—d first,' he
replied by return of post.[34] He was no more enthusiastic in 1914: 'Only a d—d
fool or a traitor would limit the size of British warships,' ran Fisher's pugnaciously
uncompromising minute on this occasion.[35]

   Formal proposals, wherever they came from, fared no better. In the run up to
the second international peace conference at The Hague in 1907 arms control

   [31] Herwig, *'Luxury Fleet'*, 71.
   [32] Michael Epkenhans, *Tirpitz: Architect of the German High Seas Fleet* (Washington, D.C., 2008),
54; Herwig, *'Luxury Fleet'*, 89.
   [33] Henderson, Naval Attaché Report 9/14, 7 February 1914, in Seligmann, *Naval Intelligence*,
533–4.
   [34] Fisher to Esher, 21 February 1908, in Marder, *Fear God and Dread Nought*, ii, p. 164.
   [35] Minute by Fisher, 16 January 1914, TNA, ADM 116/1677.

enthusiasts suggested that not only should the number of warships in service be restricted, but so, too, should the size of future construction. The Admiralty was alarmed and Fisher instructed the then Director of Naval Intelligence, Sir Charles Ottley, to pen an extensive rebuttal of this unwelcome and heretical suggestion. Coming in at fifteen closely printed pages and distributed widely across Whitehall, it was packed with every conceivable objection.[36] Buried among these was the fundamental truth that plunging was vastly more inconvenient for Britain's potential enemies than it was for Britain herself. This was especially true for Germany because, unlike Britain, which had plenty of deep harbours with unencumbered approaches, Germany's coastal waters, as the memorandum explained, were inconveniently shallow. As heavier warships meant deeper draughts and deeper draughts produced a requirement for deeper water, Germany's shallow littoral was a barrier to increased displacement. Only by an expensive process of dredging new deep channels, could Germany's naval harbours be made suitable for the larger warships of the dreadnought revolution. Naturally, this added additional expenditure to the German naval budget, further pushing up the already prohibitive costs of competing with Britain. Why, it was implied, would Britain voluntarily agree to steps that would alleviate Germany of this burden? By such means died the qualitative arms control proposals of The Hague conference.

In addition to the budgetary difficulties it imposed on rival powers, another key asset of plunging was that it inspired an overwhelming confidence in Britain that the Royal Navy enjoyed a massive advantage in the quality of its ships and *matériel* compared to its German adversary. Nowhere was this sense of superiority greater than in the question of gun power. The German reluctance to increase the calibre of battleship main batteries, even as the Royal Navy progressively stepped up its own weaponry, meant that the Royal Navy's fleet of modern 15-inch, 13.5-inch and 12-inch-gunned dreadnoughts was ranged against adversaries armed mostly with 12-inch and 11-inch artillery. Surveying the implications in June 1914, Churchill observed that the last three British new construction programmes consisted of fourteen new vessels firing 112 15-inch guns for a total broadside of 215,000 lbs. By contrast, the German Navy was due only four new vessels, whose thirty-four guns had an aggregate weight of broadside of a mere 55,120 lbs. This represented a four-fold advantage for the Royal Navy. Widening the scope to consider the two dreadnought fleets in their entirety, Churchill concluded that the British advantage in firepower was 'approximately equal in strength to the whole German line of battle'.[37] It was a comforting thought and one from which Churchill evidently derived much satisfaction. Eager to guard against an unwarranted underestimate of the enemy, the Second Sea Lord, Sir John Jellicoe, attempted to puncture Churchill's assurance by producing a comparison of the two fleets based not upon firepower, but upon the relative displacement of warships of compar-

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[36] 'Memorandum on: 1. Limitation of Naval Armaments; 2. Limitation of Size of Battleships', 29 January 1907, TNA, ADM 116/866B. The original version, dated 6 December 1906, in TNA, ADM 1/7904, makes Ottley's authorship clear.

[37] Minute by Churchill, undated [June 1914], TNA, ADM 116/3091.

able vintage. The startling conclusion he drew from this alternative methodology was that 'it is highly dangerous to consider that our ships as a whole are superior or even equal fighting machines'.[38] Jellicoe's was, however, a minority, not to say solitary, view and Churchill was anything but persuaded, making the telling point that if Jellicoe's analysis were true (which he strongly disputed), Jellicoe as a former Controller of the Navy, the officer overseeing *matériel*, could not evade personal responsibility for this reprehensible state of affairs. Churchill might also have added that as Britain was leading the qualitative race and constantly pushing up displacements, there was no group of German warships that was not outmatched, even if annual comparisons of this metric did not always work in Britain's favour. Somewhat ironically, given the later sense that Britain's main inferiority lay in battle cruisers, all British units of this type since 1909 outclassed their German counterparts on Jellicoe's measure. Whether Jellicoe planned to reply to this is unknown: he had not done so by the time war broke out that August. Thus, it can be said that on the eve of conflict the assurance that, courtesy of constant plunging, Britain held an unassailable lead in warship design and naval technology and outclassed Germany as a consequence was nigh universal; and this was not just in Britain.

Among those with the deepest concern that British ships were the more powerful were some key members of the German establishment. The most prominent of these was the Kaiser. Although he ultimately sanctioned all the ship designs Tirpitz placed before him, in private Wilhelm had long railed against the comparative weakness, as he saw it, of German naval vessels. During the early years of the twentieth century this had led the emperor to become a convinced advocate for larger and faster warships, proposals for which he regularly sent to the Imperial Navy Office. A particular *idée fixe* was the concept of the *schnelle Linienschiff* or fast ship of the line, a pet project that in some respects anticipated the battle cruiser that Wilhelm attempted to foist on a reluctant Tirpitz on almost every possible occasion. As such, it was a source of much friction between them in 1903 and 1904. The German switch to the building of dreadnoughts, involving as it did a considerable rise in displacements and firepower, suited Wilhelm's inclinations and so momentarily eased the debate between the emperor and his state secretary. However, as British ships progressively increased in size, displacement and gun calibre, so the Kaiser's interest in larger and more powerful vessels gradually resurfaced: 'Since we have excellent engineers, technicians, and officers, why are we always behind?' he demanded of Tirpitz in the summer of 1912.[39] Stung by this remonstrance, Tirpitz strongly re-affirmed his philosophy of emphasizing quantity over quality: 'Our principle,' he told the Kaiser, 'should be here is the weapon, make use of it.' And in a most unfortunate analogy he compared the situation in 1912 to that of 1870 when the Prussian Army had prevailed over France despite the marked superiority of the French Chassepôt rifle over the German needle gun. Wilhelm was incensed: 'As supreme warlord I could never

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[38] Minute by Jellicoe, 14 July 1914, *ibid*.
[39] Kelly, *Tirpitz and the Imperial German Navy*, 346.

tolerate such a standpoint. Only the best and newest weapons are good enough for my fleet,' he stormed.[40] The leaders of the fleet felt likewise and expressed considerable dissatisfaction with the *matériel* Tirpitz bestowed on them. 'Either the ships of the Navy Office are fast, and then they have insufficient firepower. Or they have good artillery on board, and then they are not fast!' wrote an exasperated Admiral von Holtzendorff in a passage indicative of the divide within the German Navy over the need to respond to the constant design improvements foisted on Germany by the British Admiralty.[41] It was a division never properly reconciled. The front might have wanted better ships, but in the quest for greater numbers Tirpitz would not provide them. Hence the German sense of inferiority never went away.

The British refusal to compete with the German Navy solely on the single metric of ship numbers, instead making war readiness, technological progress, and design enhancements integral additional elements of the arms race threw all of Tirpitz's carefully crafted plans into confusion and, as has already been explained, sent the cost of competition to stratospheric levels. The reality of this situation would take a while to sink in—not least because it was an unpalatable truth that the naval leadership, in true ostrich mode, wished to deny—but, when reality finally dawned, the consequences for the German Navy would prove severe. Following the 1912 *Novelle* money for the further development of German maritime power dried up, as the shock produced by the Second Moroccan Crisis in 1911 focused the attention of the Reich government on deficiencies in the army rather than the navy. From now on, military spending would be the priority. In the short term, this made it difficult even to fulfil the provisions of legislation already passed. To achieve this, wrote Tirpitz's deputy, Admiral Eduard Capelle, it would be necessary for the 'greatest restraint [to be] exercised in all areas'.[42] In the longer term, lack of resource meant that additional naval expansion ceased to be an option. Thus, a new *Novelle* that Tirpitz had hoped to bring forward in 1913 in order to accelerate the construction of capital ships, had to be dropped in the face of determined opposition from the Chancellor and the Imperial Treasury; while appeals to the Kaiser for extra funds now fell on deaf ears. All of this reflected the priority now accorded to the army. To make matters worse, in the same period funding for the Royal Navy seemed to lack the same constraints. Indeed, owing to Lloyd George's 'People's Budget' of 1909, the British state successfully broadened the fiscal base of its tax system, thereby providing the funds that consistently allowed Britain to authorize twice as many new ships as Germany. The net consequence of this disparity was to engender a growing sense that the arms race with Britain had been lost: 'The English can, and always will be able to build twice what we can,' wrote Chancellor Bethmann Hollweg's close advisor, Kurt Riezler, in 1914.[43] As a civilian and known critic of Tirpitz, Riezler could be ignored, but even within the German naval leadership there was a realization that defeat beckoned. 'The English navy

[40] Michael Epkenhans, ed., *Albert Hopman*: *Das ereignisreiche Leben eines 'Wilhelminers' Tagebücher, Briefe, Aufzeichnungen 1901 bis 1920* (Munich, 2004), 235.
[41] Herwig, *'Luxury Fleet'*, 201.   [42] Bönker, *Militarism*, 287.
[43] Herwig, *'Luxury Fleet'*, 91.

has so strongly developed that […] the whole foundation of our fleet policy is endangered,' exclaimed Capelle in a draft memorandum written in May 1914 in preparation for an audience between Tirpitz and the Kaiser.[44] Capelle blamed this desperate situation on the 'extraordinarily active, energetic and politically influential Churchill', whose strong response to the 1912 *Novelle* had negated its provisions, but the reality was that the bankruptcy of German naval policy was intrinsic to the German plans themselves: Germany did not possess the capacity to embark upon a naval arms race with Britain fought on both quantitative and qualitative terms.

If German plans were ultimately frustrated by the tactics Britain adopted, it should be said that it is by no means certain that Germany would have fared better had Tirpitz's initial assumptions about relatively static battleship costs proven accurate and had Britain conformed to Tirpitz's desires and embarked upon a purely quantitative race. Indeed, there are good grounds for thinking that the Royal Navy would still have possessed the decisive edge, as Britain, unlike Germany, had recent experience of competing in and winning a numerical naval arms race. The latter decades of the nineteenth century had been a period of intense rivalry between Britain and her then opponents, France and Russia. As a result, the Royal Navy had found itself in a continuous struggle to keep ahead of the combined naval programmes of these two powers. And it had succeeded.[45] Although the cost had been considerable, across two decades Britain had built enough battleships and armoured cruisers to ensure that the officially sanctioned policy of being 'strong enough to beat France and Russia for certain' had generally been maintained.[46] If this could be achieved against such long-standing maritime powers as France and Russia, there is every reason to believe that it could also have been achieved against Germany. The counter-factual proposition, therefore, is that the stress on war preparedness and technological advance that Fisher and his successors adopted was not necessary to the British victory in the naval race; this was merely a tactical choice about the best way to discomfort the opposition. As such, it was eminently successful.

This success can be measured in several ways. Firstly and most obviously, there is the German admission, previously referred to, that by 1914, if not 1912, the naval race had been lost. This was a remarkable achievement: it had taken two decades for Britain to bring France and Russia to the point of defeat, a result that was visibly underscored by, but was in no sense dependent on, the Russo-Japanese War; the German challenge was seen off in one.

For the British, however, there was another key indicator of how successful their tactics had proven to be. Naval competition with the German Empire could have taken many forms, but the dreadnought arms race locked Germany into a

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[44] Capelle, 'Notes for an Audience', 17 May 1914, in Freiburg im Breisgau, Germany, Bundesarchiv-Militärchiv [hereafter BA-MA], Tirpitz Nachlass, N253/29.

[45] Matthew S. Seligmann, 'Britain's Great Security Mirage: The Royal Navy and the Franco-Russian Naval Threat, 1898–1906', *The Journal of Strategic Studies* 35/6 (2012), 861–86.

[46] Minute by Selborne, 27 September 1901, in Arthur J. Marder, *The Anatomy of British Sea Power* (New York, 1940), 463.

type of struggle that for Britain was both easy to manage and held few terrors. The simple fact was that battleship building was an area of British strength. Given Britain's highly advanced and very capable naval-industrial complex, so long as the British government was prepared to allocate the necessary funds for new construction—and it was, albeit unenthusiastically—Germany's battle fleet was always destined to be outnumbered. Hence, throughout this period, there existed a widespread British anticipation that should war come, the German fleet would either have to cower in harbour or, if it dared venture out, quickly succumb to defeat in battle. For this reason, as one of Britain's most experienced and highly rated naval grand strategists explained, there was little reason to worry about it: 'I do not think,' wrote Rear Admiral Sir Edmond Slade, a former Director of Naval Intelligence and an important behind-the-scenes player in naval policy development, 'that we are in any danger […] [as] we can easily keep such strength as will prevent Germany from doing us any serious harm in Home waters.'[47] Others concurred. Former home fleet commander, Admiral Sir William May, for example, was not at all perturbed about the prospect of engaging the Germans; rather what concerned him was that their forces might decline to fight. In that eventuality, a dedicated strategy would be needed for luring this reluctant opponent out of port. His proposal was to target German merchant shipping, an action which, by being vexatious to the civilian population, would create so strong a 'public feeling' in Germany that 'the German war fleet will be forced to come out and give battle'.[48] May's proposal echoed official policy. As Sir Henry Jackson, the Chief of Staff, disclosed a mere three months later, the navy's war plans were 'directed against Germany's merchant marine, with the hopes that sufficient pressure can be brought, through dislocating her trade, for the German Fleet to seek action with ours, and so end the struggle'.[49] Clearly Jackson had no doubts about the outcome. It is equally evident that, without such a lure, he did not believe that the German fleet would risk battle.

If, as seems clear, German battleships held few terrors for British admirals, what did disturb many of them, Slade especially, was the prospect that the German naval leadership might abandon its concentration on this area of British strength and refocus instead on exploiting an area of British weakness. Specifically, they were concerned that the German naval leadership might realize the British vulnerability to the interdiction of the nation's food supplies and adopt the far more obvious and, to Slade, self-evidently more dangerous strategy of attacking British trade. What made this especially worrying was the belief of the British Naval Intelligence Department that the Germans were in an excellent position to undertake a campaign based upon this principle. Possessing the world's second largest merchant marine, Germany could, by the simple expedient of arming some of its numerous civilian vessels, create a swarm of commerce raiders spread

[47] Slade to Asquith, 8 May 1909, TNA, CAB[inet Papers] 16/9B, Appendix 36.
[48] May, 'Proposed Disposition of the British Fleet in the Event of War with Germany Alone', December 1912. Marder, *Dreadnought to Scapa Flow*, I, 381.
[49] Jackson, 'Remarks on War Plans and the First Lord's Notes on the Subject', 11 March 1913, TNA, ADM 116/3412.

out across the global trade routes. The moment a war started, these could be directed to drive British shipping from the seas. Such a strategy, Slade feared, if undertaken vigorously, would 'paralyze our trade in all those regions where it is difficult for us to give adequate protection under the present disposition of our fleet' and thereby cause sufficient domestic discontent to jeopardize Britain's ability to wage war.[50]

This was an alarming analysis, but what made it even more troubling was that a German assault on British commerce, especially one conducted by converted merchant vessels, would not be at all easy to counter. In the years after 1901, when this prospective strategy first came to the attention of the Naval Intelligence Department, considerable effort was expended on seeking a means to secure British trade from this menace. As war loomed in 1914, the Admiralty had already spent funds subsidising the Cunard line to build fast liners for conversion into hunter-killers that could track German raiders; it had also constructed dedicated warships for this purpose; it had sought to bring about a change in the international legal system to outlaw this practice; and it was in the process of arming select British merchant vessels for self-defence and creating a global intelligence and reporting network to track and report the movements of German raiders.[51] None of this was simple or cheap. Yet, just how much more costly and more complex it would be if Germany devoted all its energies to this form of warfare was a matter of obvious concern.

Fortunately for the Royal Navy, Slade's analysis, based on what he would have done were he in charge of German strategy, although it closely matched the thinking of the German Admiralty Staff, whose members regarded an assault on British commerce as a promising proposition, did not find favour with Tirpitz. Only very occasionally and with marked reluctance did the State Secretary agree to release funds for this purpose, and even then no more than the absolute minimum. Instead, he remained fixated on battleships. In this way, he invested heavily in a form of warfare that, as the First World War would demonstrate, could easily be contained and, as a consequence, he neglected Germany's capacity to mount a *guerre de course*, a strategy that might have caused the British Admiralty serious problems. It is hard to see how he could have played more directly into British hands. Germany's defeat in the naval race was, therefore, hardly surprising.

Losing the naval arms race was more than just traumatic for Germany: it had dangerous consequences. In the period when it was believed that the Tirpitz Plan would work, the German Navy acted as a voice for restraint in the Reich government. Tirpitz required at least two decades of uninterrupted peace to complete his construction programme and so, following the passage of the first navy bill in 1898, he argued consistently against any foreign policy initiative that might provoke conflict. This self-interested pacific tendency evaporated once it was clear that the arms race was lost. The alternative facing the naval leadership was now either

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[50] Slade to Asquith, 8 May 1909, TNA, CAB 16/9B, Appendix 36.
[51] Matthew S. Seligmann, *The Royal Navy and the German Threat 1901–1914: Admiralty Plans to Protect British Trade in a War against Germany* (Oxford, 2012).

to acknowledge the bankruptcy of their efforts, an approach that would leave them with the humiliation of a failed naval policy, or to seek to attain Germany's goals by war while it was still conceivable, if only just, for the navy to play a part. Acknowledging the failure of his life's work held no appeal to Tirpitz, who therefore gravitated quite naturally to the latter option. As he stated in October 1913 in a speech that made clear the extent of his volte-face, it would be 'more honourable for a great nation to fight for the highest goal and perhaps to go down instead of ingloriously renouncing the future'.[52]

This new belligerency came with a timetable. At one end of the calendar, war was to be avoided until the navy's key infrastructure project, the widening of the Kiel Canal, had been completed, for only then could German dreadnoughts travel easily and safely between the Baltic and North Seas. This vital consideration meant that the summer of 1914 was the earliest possible date for a conflict, a point Tirpitz emphasized at the infamous 'war council' in Potsdam on 8 December 1912. Equally, however, the disparity in British and German building rates meant that it was vital not to delay too long thereafter, lest the balance of power be tipped too far in the Royal Navy's favour by the flood of new construction taking place in British yards. Hence, just as there was a 'window of opportunity' in the land armaments race—which prioritized the moment when German military power would, relatively speaking, be at its greatest extent—so there was a comparable 'window' in the naval race, in this case focused on the point when Germany's disadvantage would be at its relative minimum. This naval window fell towards the close of 1914.

These dates and the reason for them were known to the British naval leadership. Captain Philip Dumas, a former British naval attaché in Berlin, advanced a well established proposition when he predicted to Churchill in January 1912 'that nothing would induce Germany to fight […] until the Kiel Canal was finished'.[53] Equally, Jellicoe's assertion that Britain could not afford to relax its efforts in 1914, 'because at the end of 1914 and the beginning of 1915 the British Fleet will be relatively at its weakest as compared to the German Fleet', reflected the Admiralty's consciousness of the strategic horizon.[54] As it transpired, neither of these warnings proved misplaced. War broke out at the very moment when the Kiel Canal had been completed and the German Navy was at its closest in size to the Royal Navy.

In his 2001-exposition on defensive realism, John Mearsheimer argues that states do not 'start arms races that are unlikely to improve their overall position'. He then elaborates: 'If launching an arms race is unlikely to leave the initiator in a better strategic position […] it will sit tight and wait for more favourable circumstances.'[55] Such rational behaviour was conspicuous by its absence in the case of the Anglo-German naval race. Tirpitz's decision to embark upon a competition in battleship building with Britain locked Germany into an unnecessary and

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[52] Bönker, *Militarism*, 89.

[53] Matthew S. Seligmann, *Spies in Uniform: British Military and Naval Intelligence on the Eve of the First World War* (Oxford, 2006), 194.

[54] Minute by Jellicoe, 19 September 1913, TNA, ADM 116/3151.

[55] *The Tragedy of Great Power Politics* (New York, 2001), 37, 76.

unwinnable conflict. The futile quest to attain success despite the growing number of hurdles placed in Germany's path not only meant that Germany gained little from all its exertions; it actually ensured that the nation's strategic position was seriously weakened. For the outlay of billions of marks, Germany obtained naval assets that—come the test of war—it would largely be unwilling to deploy for fear that to do so would guarantee their destruction. At the same time weapons systems that might have proved useful were starved of funding to feed the ravenous but ultimately pointless moloch of Tirpitz's devising. It was the worst of all worlds and its achievement had not come cheap.

2

Land Armaments in Europe, 1866–1914

David Stevenson

This chapter will test out the leading interpretative approaches to arms races by focusing on three periods of intense and competitive land armaments build-up in Europe: 1866–70, 1887–93, and 1910–14. First, it will examine the biggest and best known of these episodes, the land armaments contest that preceded the First World War. Second, it will make comparisons with the 1860s rivalry that culminated in the Franco-Prussian War. Finally, it will consider a third and less well-known instance, that of the late 1880s, which began by displaying similar characteristics but whose outcome was a relatively stable military balance at a higher level of preparedness. Although it will identify both commonalities and points of contrast, among its key concerns will be the question of what makes arms races dangerous.

1910–1914

Nineteenth-century arms races have been less closely studied than their twentieth-century counterparts.[1] None the less, the graph of European military expenditure between the Franco-Prussian War and the First World War highlights an upsurge in the half decade before 1914.[2] In money terms, spending by the six European Great Powers rose between 1908 and 1913 by about 50 per cent. This was less dramatic than in the 1930s, and expenditure as a percentage of Gross National Product remained much lower than in the run-up to 1939 or during the acutest phases of the Cold War, but by pre-1900 standards both the rate of increase and the proportionate military burden were high.[3] Certainly, defence outlays were divided between armies and navies, but the biggest pre-1914 naval race (that

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[1] Cf. Stig Förster, 'Facing "People's War": Moltke the Elder and Germany's Military Options after 1871', *Journal of Strategic Studies* 10/2 (1987), 218.

[2] For expenditure figures, John Hobson, 'The Military-Extraction Gap and the Wary Titan: the Fiscal Sociology of British Defence Policy, 1870–1913', *Journal of European Economic History* 22 (1993), 461–506; David Stevenson, *Armaments and the Coming of War: Europe, 1904–1914* (Oxford, 1996), 2–8. On the pre-1914 arms race see also David G. Herrmann, *The Arming of Europe and the Making of the First World War* (Princeton, 1996) and Dieter Storz, *Kriegsbild und Rüstung vor 1914 Europäische Landstreitkräfte vor dem Ersten Weltkrieg* (Herford, 1992).

[3] Stevenson, *Armaments*, 3.

between Britain and Germany) was losing impetus on the eve of hostilities.[4] It follows that land armaments expansion was primarily responsible for the overall increase. Although Britain kept its army expenditure stable, and Italy between 1911 and 1913 was distracted by a costly conflict in Libya, the four big continental land powers were engaged in a reciprocal and competitive sequence of measures that pitted the German/Austro-Hungarian (1879) alliance bloc on the one hand against the Franco-Russian (1891–4) alliance bloc on the other. This land arms race bore more directly than did the Anglo-German naval race on the causation and timing of the outbreak of war.

The origins of the land armaments race therefore matter. They may be examined with reference to each of the three main interpretations conventionally employed in armaments studies:

Technological Imperative

Technological change was central to the development of the Anglo-German naval race, but more peripheral on land. Two recent innovations had necessitated wholesale re-equipping: the magazine rifle from the late 1880s and the quick-firing recoilless field gun from the late 1890s, starting with the French 75mm. But both re-equipments had substantially been completed before the pre-war land arms race began, and although by 1910 new weapons were becoming available they contributed little to the expenditure surge. Machine guns are the most obvious instance, and European armies adopted them as standard after 1905, but only in small numbers.[5] Quick-firing mobile heavy artillery (as distinct from field guns) cost more, but formed a category in which Germany was largely unrivalled, neither France, nor Russia, nor Austria-Hungary acquiring large quantities before war broke out. Similarly, airships and aircraft were coming into service as spectacular items that, however, counted for little in the spending totals.[6] If the land arms race had continued beyond 1914, in contrast, equipment outlays would probably have been much bigger, notably on fortifications and on railways.[7] France and Russia agreed in 1913 on a major programme of railway construction in Poland; the German authorities considered a counter-programme, as did Austria-Hungary in response to growing insecurity in Bosnia-Herzegovina. The French were updating their eastern frontier fortifications, especially round Verdun, and in 1912 the Germans decided to do likewise on their Russian border. Neither railways nor reinforced concrete cupola fortresses, however, were technologically novel. What was envisaged was fresh investment in established weapons systems; and this investment, in any case, the war forestalled. Moreover, as France's 75mm field gun

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[4] Cf. Matthew S. Seligmann, 'The Anglo-German Naval Race, 1898–1914', Chapter 1 in this volume.

[5] Herrmann, *Arming*, 68–70; Paul Cornish, *Machine Guns and the Great War* (Barnsley, 2009), 23ff.

[6] Herrmann, *Arming*, 75–7, 90–2.

[7] David Stevenson, 'War by Timetable? The Railway Race before 1914', *Past & Present*, 162 (1999), 163–94; 'Fortifications and the European Military Balance before 1914', *Journal of Strategic Studies* 35/6 (2012), 829–59.

and Britain's HMS *Dreadnought* both show, technological advances often resulted from state initiatives, and to view technology as an entirely independent variable is misleading.

Although the pre-war land arms race was partly a drive for more equipment,[8] it was essentially a competition for heightened military readiness, to be achieved by organizational changes (such as modifying mobilization procedures) but primarily by maximizing trained manpower both in the standing army and in the reserves, through a combination of extending conscription service terms and calling up more men in each age cohort. In Samuel Huntington's terminology, this race was quantitative rather than qualitative.[9] Its most visible embodiment was a succession of new army laws, passed by Germany in 1912 and 1913, by Austria-Hungary also in 1912 and in 1914, by France in 1913, and by Russia in 1914. Smaller countries (notably Belgium with a law in 1913) also participated.[10] Because the arms race took this form it is impossible to understand it without reference to domestic politics, which leads us to the second interpretative approach.

Domestic Politics/Military-Industrial Complex

During the first decade of the twentieth century, army budgets and peacetime strengths grew only very slowly or were static or even declining. The reasons varied. In Germany the naval build-up received priority (as it did in Britain): the general staff favoured army expansion but the War Ministry feared enlargement would diminish manpower quality and make the army less reliable for internal repression.[11] In Austria-Hungary the general staff also favoured expansion, but was blocked by opposition, on financial and other grounds, from the governments of the Austrian and Hungarian halves of the Dual Monarchy.[12] Between 1904 and 1911, moreover, despite supposedly being allies, Austria-Hungary and Italy were diverting resources into an arms race against each other, building fortifications in the Alps and battleships for the Adriatic.[13] In France the military leadership was under attack because of its involvement in the Dreyfus Affair, and a 1905 law shortened the active infantry service term from three years to two.[14] Finally Russia, after its 1904–5 defeat by Japan, not only diverted half its rearmament equipment budget to the navy but also suffered four years of poor harvests and budgetary stringency,

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[8] Equipment items probably accounted for less than a quarter of European army budgets before 1914, Stevenson, *Armaments*, p. 10n.

[9] Samuel P. Huntington, 'Arms Races: Prerequisites and Results', *Public Policy* 8 (1958), 65.

[10] David Stevenson, 'Battlefield or Barrier? Rearmament and Military Planning in Belgium, 1902–1914', *International History Review* 29/2 (2007), 473–507.

[11] Cf. generally Stig Förster, *Der doppelte Militarismus: die deutsche Heeresrüstung zwischen Status-Quo-Sicherung und Aggression, 1890–1913* (Stuttgart, 1985).

[12] In addition there was an internal crisis in 1904–6 over Hungarian demands for the use of Magyar as a language of command, Gunther E. Rothenberg, *The Army of Francis Joseph* (West Lafayette, Indiana, 1976), chapters 9–10.

[13] Michael Behnen, *Rüstung-Bündnis-Sicherheit: Dreibund und informeller Imperialismus, 1900–1908* (Tübingen, 1985).

[14] Douglas Porch, *The March to the Marne: the French Army 1871–1914* (Cambridge, 1981), chapters 4, 5, 10.

while peasant unrest required several infantry divisions to be redeployed to the interior and dissension spread into the army.[15] In turn, the evidence that Russia could not threaten Central Europe weakened the advocates in Berlin and Vienna of military expansion, thus completing the circle.

All the pre-1914 powers were relatively open societies, with elected legislatures and uncensored media. Army laws were expensive and removed more sons and husbands from their families and employees from their workplaces. They therefore tended to be unpopular, and business lobbyists were too weak unaided to force up military production targets. Pre-1914 armaments manufacture was a mixed economy in which state arsenals operated alongside private enterprises that had grown up since the mid-nineteenth century, such as Armstrong and Vickers in Britain, Schneider in France, Krupp in Germany, Škoda in Austria, and Putilov in Russia. To operate at full capacity they had to supplement domestic demand by export orders. Most of them were more committed to warship than to army supply, however, and even Krupp—the largest and best-connected armaments firm in Europe—made higher profits on its naval than on its land artillery arm.[16] None the less, in the winter of 1911–12 the German authorities decided on a *Rüstungswende* or 'armaments turning point' whereby their expenditure priority switched from dreadnoughts to the army.

The Action-Reaction Model

This leads on to the third approach: the action-reaction model of a spiral of reciprocal armaments increases in response to perceived external threats. In itself it is a descriptive metaphor carrying little explanatory weight, as it fails to account for how the upward spiral starts in the first place. It none the less remains the most applicable of the three to the pre-1914 land armaments race, but only if located within the context of the shifting continental strategic balance and of Europe's diplomatic alignments and flashpoints.

The first fundamental to bring into the equation is Russia, whose power position collapsed after the Japanese war but then bounced back. Between 1904 and 1908 the Central Powers of Austria-Hungary and Germany were unusually secure. After 1909, in contrast, a run of good harvests defused Russian internal unrest and boosted government revenue, much of which the tsarist authorities channelled into rearmament.[17] These factors enabled the Russian military reorganization of 1910, the development with the best claim to be the starting pistol for the pre-war land armaments race. Its central feature was the adoption of a territorial mobilization system enabling the army to transition faster from peacetime to wartime strength, prior to the 'concentration' or troop transports to the deployment zone. Admittedly the centre of gravity of the peacetime force distribution was simultaneously pulled

[15] K. F. Shatsillo, *Russkii imperializm i razvitie flota nakanune pervoi mirovoi voiny (1906–1914gg)* (Moscow, 1968), 65–9; Stevenson, *Armaments*, 77–8.

[16] Stevenson, *Armaments*, 22–6.

[17] Cf. Peter W. Gatrell, *Government, Industry, and Rearmament in Russia, 1900–1914: the Last Argument of Tsarism* (Cambridge, 1994).

back eastwards from the tip of the Polish salient toward the base, and Russia's 1910 concentration plan was cautious and defensive. The reorganization's architects hoped to increase the army's efficiency for operations in any direction rather than specifically against the Central Powers.[18] But in Berlin and Vienna it was the speedier mobilization that focused attention.[19] Moreover, Russia's revival was only just beginning. In 1912 the Russians adopted a much more aggressive war plan. They intensified their staff conversations with the French and in December 1913 they concluded a railway agreement that by 1917–18 would enable them to transport their mobilized divisions up to 30 per cent faster to the deployment zone.[20] On 7 July 1914 their legislature gave final approval to the 'Great Programme' for reinforcing the army.[21]

The impact of the tilting military balance was amplified by the pre-war diplomatic crises. The interaction between these crises and rearmament was integral to the dynamics of international politics in the period, the first and second Moroccan crises of 1905–6 and 1911 being followed by the Bosnian annexation crisis of 1908–9 and the 'winter crisis' accompanying the First Balkan War in 1912–13. These crises came ever faster, and each was more acute than its predecessor. Each was also more militarized, prompting greater military preparations, so that across Europe nearly three quarters of a million men above the normal peacetime quotas were with the colours by early 1913.[22] The First Moroccan Crisis encouraged a temporary burst of re-equipment in France and Germany but its effects were otherwise limited, although it did encourage Britain to strengthen its ties with Russia and France. The Bosnian annexation crisis had more serious consequences because Russia found itself unable to risk a war and was therefore humiliated, which spurred its leaders towards rearmament and the reorganization of 1910. The Second Moroccan, or Agadir, Crisis, conversely, led directly to the Germans' *Rüstungswende* decision to prioritize land rearmament at the navy's expense. Finally, the First Balkan War precipitated a new power shift in the Balkans, where Russia's protégés, Serbia and Montenegro, seized territory from Ottoman Turkey and menaced Austria-Hungary's southern frontier. Not only did the Balkan crisis end the Hungarians' resistance to army increases; it also encouraged Germany to introduce another bill, which became the army law of 1913. This measure in turn prompted France to revert from two-year to three-year active service, as well as to approve a major equipment credit; while the Russians (though here the connection with the Balkans was less direct) introduced their 'Great Programme' for army expansion over four years.

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[18] Vladimir A. Sukhomlinov, *Erinnerungen* (Berlin, 1924), 228–331, 333.

[19] Riste Ropponen, *Die Kraft Russlands: wie beurteilte die politische und die militärische Führung der europäischen Grossmächte in der Zeit von 1905 bis 1914 die Kraft Russlands?* (Helsinki, 1968), 241; report by Chief of the General Staff [hereafter CGS] Abt. 1, 14 November 1910, Politisches Archiv des Auswärtigen Amtes, Berlin [hereafter PAAA] R.10450.

[20] Moltke to Bethmann, 15 December 1913, 11 July 1914, PAAA R.11011.

[21] GGS 1. Abt., 4 July 1914, 'Die wachsende Macht Russlands', PAAA R.996.

[22] David Stevenson, 'Militarization and Diplomacy in Europe before 1914', *International Security* 22/1 (1997), 125–61.

The public discourse of the period (particularly the legislative debates) confirms that by 1913 the powers were responding to the international political environment rather than to technological changes or internal pressures. It is true that the internal pressures were greater than previously, but this was primarily because the diplomatic crises had inflamed popular nationalism. The 'nationalist revival' in France in 1912–13, and the formation in 1912 of the *Deutscher Wehrverein* (German Defence League), which grew to 360,000 affiliated members and lobbied for a big army increase, are the best examples. However, even the 1913 German military law was less than the DWV wanted, and armaments competition also strengthened opposition to military preparedness from socialists and progressives. In fact it polarized public opinion, even if on balance by 1912–13 the domestic obstacles to military legislation had lessened.

The confidential files shed more light on the real motives for the arms increases. These were partly deterrence. The Austro-Hungarian government believed that the Bosnian frontier was too exposed to Serbian attack, and wanted to safeguard it by rail construction and larger protection forces. Reinforcement against surprise of the 'couverture' or covering garrison was also a professed justification for France's three-year service law. But a second objective was more successful crisis management if further trials of strength none the less occurred. Russia is the outstanding example: the tsarist authorities in autumn 1912 first conducted a 'trial mobilization' and then omitted to release as normal their oldest conscript cohort, thus boosting their standing army by 350,000 men.[23] Conversely one of the arguments invoked for the German 1912 army law was disappointment over the 1911 Agadir Crisis, which suggested that Germany's navy was ineffective as a means of political pressure and a reinforced army might do better.

The final purpose behind the land build-up, however, was to improve the chances of victory if deterrence and crisis management failed.[24] A change in the tone of confidential memoranda can be detected as tension mounted and successive alerts accustomed leaders to contemplating the eventuality of hostilities. Thus the Russians prepared a scheme known as the 'Period Preparatory to War' for accelerating mobilization, which German intelligence would detect when it was implemented in July 1914.[25] In addition, the new armaments measures were connected with developments in strategic planning. France is the best example, the Three Year Law being intended partly to prepare the army for the headlong offensive into Germany

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[23] Louis to Poincaré, 2 January 1913, *Documents diplomatiques français [hereafter DDF]* 3ème ser. V, doc. 154.

[24] This point is controversial. However, the evidence does not seem conclusive to this author that the German leaders engaged on land rearmament with the deliberate and premeditated intention of provoking a general European war, although the *possibility* of doing so was under consideration as an option from at least 1912. Cf. David Stevenson, 'Was a Peaceful Outcome Thinkable? The European Land Armaments Race before 1914', in Holger Afflerbach and David Stevenson, eds., *An Improbable War? The Outbreak of World War I and European Political Culture before 1914* (New York/Oxford, 2007), chapter 7.

[25] Stevenson, *Armaments*, 316, 383; cf. Sean McMeekin, *The Russian Origins of the First World War* (Cambridge, MA/London, 2011), 61ff. However, the Preparatory Period was not tantamount to mobilization. See Antony Heywood, 'Russia's "Secret Mobilization" in July 1914' (in Russian), *Rodina*, 28 May 2013.

entailed in the 1913–14 Plan XVII, which replaced a previous counterstroke scheme. Russia similarly in its concentration schedule '19 revised' of 1912 and its schedule 20 of 1914 adopted plans for an immediate double invasion of Austria-Hungary and of Germany instead of its previous defensive-offensive strategy.[26] The Germans, conversely, had long intended to start by throwing their main forces westwards and invading France via Belgium.[27] But their 1912 and 1913 army laws and their 1914 plans for eastern fortifications and trunk railway building were intended to maintain that strategy's viability when the general staff believed the altering strategic balance threatened to undermine it.

The Anglo-German naval race was a major reason for the British government's and public's acceptance of war with Germany.[28] Moreover, the German authorities in 1914 may have been encouraged to risk hostilities before the ratio in capital ships moved further against them.[29] But the land arms race more directly influenced the decisions that escalated a Balkan crisis into a European war. In the Balkans a local armaments competition had been under way since 1906 between Austria-Hungary on the one hand and Serbia and Montenegro on the other. The Balkan Wars of 1912–13 had run down Serbia's finances, weapons, and ammunition, and in spring 1914 it was searching desperately for rifles. 'Apis' (Dragutin Dimitrijević), the head of the Black Hand organization in Belgrade that supplied the Sarajevo assassins with their bombs and revolvers, may have mistakenly supposed the Archduke Franz Ferdinand to be the leader of the war party in Vienna, and have hoped by killing him to postpone a showdown with Austria-Hungary; but his actions had the opposite effect.[30] For Austria-Hungary, conversely, 1914 was a relatively favourable moment for Balkan operations, though launching a European war—as even the ultra-hawkish CGS Franz Conrad von Hötzendorff acknowledged—was a desperate gamble, conceivable only if Germany endorsed it. But this the Germans did. The Prussian War Minister Erich von Falkenhayn advised in July 1914 that his army was ready;[31] CGS Helmuth von Moltke the Younger had briefed Chancellor Theobald von Bethmann Hollweg that the 1913 military law was already largely implemented and the German Army stood in a relatively strong position, whereas the 1913 military service extension had temporarily diluted the quality of the French Army, which also lacked a good modern

[26] On war plans, Jack Snyder, *The Ideology of the Offensive: Military Decisionmaking and the Disasters of 1914* (Ithaca, NY, 1984); Richard F. Hamilton and Holger Herwig, eds., *War Planning 1914* (Cambridge, 2010); Bruce Menning, 'Russian Military Intelligence, July 1914: What St Petersburg Perceived and Why it Mattered', *The Historian* 77/2 (July 2015, 213–68).

[27] For the 'Zuber debate' on German pre-war planning, see, *inter alia*, Hans Ehlert, Michael Epkenhans, and Gerhard P. Groß, eds., *Der Schlieffenplan: Analyse und Dokumente* (Paderborn, 2007), especially the documents appended, 394ff.

[28] Cf. the conclusion of the reappraisal by Jan Rüger, 'Revisiting the Anglo-German Antagonism', *Journal of Modern History* 83/3 (2011), 579–617.

[29] Cf. Seligmann, 'Anglo-German Naval Race', Chapter 1.

[30] D. Mackenzie, *Apis: the Congenial Conspirator—The Life of Colonel Dragutin T. Dimitrijević* (New York, 1989).

[31] Reichsarchiv, *Der Weltkrieg 1914–1918: Kriegsrüstung und Kriegswirtschaft*, Vol. I (Berlin, 1930), p. 25; Holger Afflerbach, *Falkenhayn: politisches Denken und Handeln im Kaiserreich* (Munich, 1996), 149.

rifle or sufficient heavy artillery.[32] By 1916, in contrast, the French military reforms would be taking effect, and by 1917–18 strategic railway building would enhance the Russian Army's striking power and the Great Programme would enlarge its mobilized strength and its artillery, while the 1913 Belgian military law would reinforce the garrisons of the Liège and Namur fortresses that German planning required to be seized quickly. Conversely, the expense first of the dreadnought race and then of land rearmament had pushed the German Reich finances into deficit, and the 1913 army law had been paid for by a one-off wealth tax that had needed Socialist support to pass through the Reichstag. Further rounds of spending would politically be extremely difficult for Germany and Austria-Hungary to finance, but less so for Russia, France, and Britain.[33]

   If the German Army had reasons to act quickly, for France and Russia war had been inconceivable five years earlier but now they felt able to risk hostilities rather than back down. In 1905 the French Premier had sacked his foreign minister rather than resist Germany's demands; in 1908–9 Russia had acquiesced in Austria-Hungary's annexation of Bosnia in large part because its armed forces were in no condition to risk a European war. But by 1911–12 French general staff appraisals were becoming more confident that France and Russia could win such a war, and they communicated their optimism to St Petersburg.[34] In July 1914 the Russian War and Navy Ministers supported the Foreign Minister in a policy of firmness, and were even enthusiastic about the possibility of hostilities.[35] The French President, Raymond Poincaré, may have feared that after a swing to the left in recent elections the National Assembly would weaken the Three Year Law that autumn.[36] In Britain the Cabinet appears not to have sought a military appraisal, but the Director of Military Operations, Sir Henry Wilson, was familiar with French thinking,[37] and Prime Minister Herbert Asquith and Foreign Secretary Sir Edward Grey were aware of an Admiralty economic warfare scheme that aimed to paralyse Germany's trading and financial system.[38] The key point is that both sides saw the Central Powers as being on a downward trajectory and their opponents as on an upward one, and this perception encouraged them first to risk and then to accept hostilities. The armaments race and the associated shift in the military balance by no means constitute a sufficient explanation of the

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[32] Moltke to Bethmann, 9 March 1914, Bundesarchiv [hereafter BA] Rklei R.43F/107. The French implemented the measure by calling up two new conscript cohorts in autumn 1913, meaning that two thirds of the men under arms were freshly conscripted.

[33] Niall Ferguson, 'Public Finance and National Security: the Domestic Origins of the First World War Revisited', *Past & Present* 142 (1994), 141–68.

[34] Conseil supérieur de la défense nationale [hereafter CSDN], Section d'études, Note de présentation, 9 January 1912, Service historique de l'armée de terre, Vincennes [hereafter SHA] 2.N.1.

[35] Dominic C. B. Lieven, *Russia and the Origins of the First World War* (Basingstoke, 1983), 141–4.

[36] Gerd Krumeich, *Armaments and Politics in France on the Eve of the First World War* (Eng. transl., Leamington Spa, 1984), 214.

[37] Keith Jeffery, *Field Marshal Sir Henry Wilson: a Political Soldier* (Oxford, 2006), 102–4.

[38] Nicholas A. Lambert, *Planning Armageddon: British Economic Warfare and the First World War* (Cambridge, MA, 2012), 176–8.

outbreak of war, but they did form a necessary precondition for it and are critical to an understanding of its timing.

1866−1870

We now turn to the arms race before the Franco-Prussian war of 1870. In this period the diplomatic alignments were more fluid, and the contest not between two coalitions but between Prussia (after 1867 the North German Confederation) and the French Second Empire. Whereas the pre-1914 land armaments race was primarily quantitative and in manpower, that before 1870 was qualitative as well as quantitative and took place against the backdrop of the introduction of steel, breech-loading weapons with rifled barrels both for the infantry (to replace the smooth-bore muzzle-loading musket) and for the field artillery, at the same time as railways were adopted for deployment and supply.[39] Despite these contrasts between the two periods, however, there were also striking similarities, especially in the relationship between the armaments race and the outbreak of hostilities.

At the beginning of the 1860s most observers considered the French Army to be the best in Europe. This judgement seemed borne out by its performance in the Crimean War and by its victories over Austria in the Italian war of 1859. In the latter year Prussia's partial mobilization in support of Austria had exposed serious weaknesses in its mobilization system, which the new team of Regent Wilhelm (later King Wilhelm I), War Minister Albrecht von Roon, and CGS Helmuth von Moltke the Elder was determined to remedy.[40] Initially their rearmament efforts were intended to reinforce the country's military power in general, and as a precaution against war with France, Russia, or Austria rather than against France particularly. The Prussian Army had been the first in Europe to introduce a breech-loading rife—the Dreyse needle gun (*Zundnadelgewehr*)—as its standard infantry weapon, in a transition that proceeded gradually from 1843 onwards.[41] Moltke stepped up planning to use railways for mobilization and concentration, and tested it in exercises.[42] But Wilhelm's key concern was manpower. Prussia was unusual in having preserved a short-service mass conscription system after the Napoleonic Wars: under the law of 1814 men served three years in the standing army and two in its reserves before transferring to the second-line *Landwehr*, but the mass was not very mass and the standing army had lagged behind the country's growth in population.[43] The 1860 reform bill would lower the military service term to three years,

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[39] On the mid-nineteenth-century military revolution, William McElwee, *The Art of War: Waterloo to Mons* (London, 1974), chapter 4; William H. McNeill, *The Pursuit of Power: Technology, Society, and Armed Force since AD 1000* (Oxford, 1983), chapter 7.

[40] Michael Howard, *The Franco-Prussian War: the German Invasion of France, 1870–1871* (London, 1961), 19–20; Dennis Showalter, *The Wars of German Unification* (London, 2004), 69–82.

[41] *Ibid.*, 5.

[42] Arden Bucholz, *Moltke, Schlieffen, and Prussian War Planning* (Oxford, 1991), 39–43.

[43] In 1814 the standing army stood at one eightieth of the population; by 1857 it stood at one one hundred and seventeenth. Hamilton to Russell, 22 February 1862, The National Archives, Kew, UK [hereafter TNA] F[orign]O[ffice]/64/534.

but expand the conscript uptake and place regular officers in command of the *Landwehr* units.[44] It aimed to strengthen the standing army but also to align the *Landwehr* more closely with the standing force in equipment, training, and discipline. Wilhelm had a domestic agenda—he remembered the 1848 revolution and wanted to strengthen royal power relative to the progressive liberal opposition—but in addition he and his advisers sought to counter Prussia's exposed geographical position and enhance its diplomatic leverage. According to the British military attaché, the law would have not been worth the trouble were it not for the need 'to enable Prussia as a first-rate power to maintain her position amongst other European nations'.[45] None the less, liberal parliamentarians concerned about the internal political balance resisted the measure, and Prince Otto von Bismarck was brought in as minister-president in 1862 in order to impose it.[46] Only after Prussia defeated Austria in the Seven Weeks War of 1866 did the liberals split, the majority voting to justify retrospectively the government's actions by means of the 1867 Indemnity Law.[47] As after 1910, in fact, external events generated popular support for arms increases, rather than the other way round. The needle gun, the speed of railway-backed mobilization and concentration, and the new increments of trained manpower all contributed to Prussia's rapid and unexpected victory over Austria in 1866 at the Battle of Sadowa/Königgrätz.[48]

It was after 1866 that France responded, and this year should therefore be seen as the beginning of the Franco-German arms race. During the Revolutionary Wars France had pioneered the principle of universal liability to military service, but under the post-1815 Restoration it had reverted to a long-service system, and even after Napoleon III established the Second Empire the pace of military change was slow. Part of the explanation was that Napoleon had also been engaged in a naval race against the British, which had now lost impetus.[49] But in addition, conservative professional opinion held that a long-service army was a more effective fighting force, and better able to adapt to the incoming new weaponry. France had a system of seven-year engagements, and many of its soldiers were battle hardened, but unlike their Prussian counterparts they could not be rapidly reinforced. During the war of 1866 Napoleon felt he lacked the capacity for timely intervention in Central Europe, and at a summit conference at Compiègne in November he insisted on a

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[44] Gordon A. Craig, *The Politics of the Prussian Army, 1640–1945* (London: Oxford University Press, 1964), 138ff.; John Gooch, *Armies in Europe* (London, 1980), 87ff.; Showalter, *Wars of German Unification*), 66ff. For detailed analyses, interpreting the primary purpose of the reform as being to gain leverage against Austria, Crowe to Russell, 1, 8 October, and 3 December 1859, TNA, FO/64/484; Hamilton to Russell, 22 February 1862, TNA FO/64/534.

[45] Hamilton to Russell, 22 February 1862, TNA FO/64/534.

[46] Craig, *Prussian Army*, 163–4.

[47] *Ibid.*, 159ff.

[48] Gordon A. Craig, *The Battle of Königgrätz: Prussia's Victory over Austria, 1866* (Philadelphia: reprinted, 2003). The Roon reform increased the Prussian Army's war strength from 532,700 to 615,900, Manfred Messerschmidt, 'The Prussian Army from Reform to War' in Stig Förster and Jorg Nagler, eds., *On the Road to Total War: the American Civil War and the German Wars of Unification, 1861–1871* (Cambridge, 1997), 266.

[49] Ian Hamilton, *Anglo-French Naval Rivalry 1840–1870* (Oxford, 1993), chapter 8.

manpower increase.[50] His regime, however, was in transition from an autocratic to a parliamentary system. After 1866 French public opinion switched rapidly to viewing the new North German Confederation as the principal threat to national security, a perception that would endure for the next eighty years.[51] Yet this perception did not translate into support for a larger conscript cohort, and Napoleon encountered opposition both from the legislators and from the high command, on the grounds that his reform would increase burdens on civilians and diminish military effectiveness.[52] Initially he wanted to be able to call up all able-bodied men for service either in the standing army or in the reserves, but the *loi Niel* steered through by War Minister General Adolphe Niel in 1868 fell short of the emperor's hopes and primarily reinforced the second-line troops of the *garde nationale mobile*.[53] In contrast, French equipment spending rose sharply and had tangible consequences: the issue of one million chassepot rifles (which were superior to the needle gun), as well as of smaller numbers of prototype machine guns (*mitrailleuses*).[54]

These French efforts were insufficient to nullify the Germans' advantage, and after defeating Austria the latter took further steps. The armaments competition was now linked to an intensified political rivalry that generated a succession of crises. Napoleon unavailingly sought 'compensation' in the Low Countries for Prussia's new-won domination over northern Germany, and warned that further expansion into Southern Germany would constitute a *casus belli*. But Bismarck intended precisely such expansion, and already in 1867 the Prussian military system was extended to the other members of the emergent North German Confederation.[55] Whereas initially domestic calculations had contributed to the government's enthusiasm for reform, the external situation was now primary. Although the Prussians stuck with the now outdated needle gun, they replaced their artillery (which had proved inferior to the Austrian cannon) by new

[50] Napoleon told the legislature that a nation's influence depended on the number of men it could put under arms, Richard D. Challener, *The French Theory of the Nation in Arms, 1866–1939* (New York, 1955), 10–17. The French military authorities estimated that Prussia had 1.2 million trained men; France 288,000, Howard, *Franco-Prussian War*, 29.

[51] Claude Digeon, *La Crise allemande de la pensée française* (Paris, 1959), 24ff; Raymond Poidevin and Jacques Bariéty, *Les Relations franco-allemandes 1815–1975* (Paris, 1977), 72–3; summary of French 1866–7 military measures in cover letters for British attaché reports, TNA FO/27/1695.

[52] According to the British Embassy, the French people 'desired some measure which should once more reinstate them in the position of arbiters in Europe, which they believed to have given place to the supremacy of Prussia […] an army more numerous, and at least as well disciplined and equipped, as any that Prussia could bring into the field.' Yet there was also strong opposition to calling up extra men, as well as to the cost: Fane despatch, 7 January 1867, TNA FO/27/1656.

[53] Thomas. J. Adriance, *The Last Gaiter Button: a Study of the Mobilization and Concentration of the French Army in the War of 1870* (New York, Westport, and London, 1987), 31; Geoffrey Wawro, *The Franco-Prussian War: the German Conquest of France in 1870–1871* (Cambridge, 2003), 46. The law was intended to call up 172,000 men annually and create by 1875 a total mobilized strength of 800,000, Howard, *Franco-Prussian War*, 33. For Napoleon's initial plans, Claremont to Cowley, 11, 13 December 1866, FO 25/1625.

[54] François Crouzet, 'Recherches sur la production d'armements en France (1815–1913)', *Revue historique*, 59 (1974), pp. 51, 54; Wawro, *Franco-Prussian War*, 52–3.

[55] In 1870 the German states mobilized 1.184 million men, nearly twice the size of Napoleon I's *Grande armée* in 1812, Howard, *Franco-Prussian War*, 23.

steel-barrelled Krupp breech-loaders, which the French failed to match.[56] Finally, the general staff presided over further railway improvements, which ensured that in 1870 the Germans' mobilization was faster than ever and that in the opening battles their troops had a two to one superiority.[57]

By the time of the crisis of July 1870, therefore, both sides' military chiefs had grounds for considering the moment favourable to take the plunge. Before doctoring the Ems Despatch—the crucial step that provoked France into declaring war—Bismarck consulted Moltke and Roon, who said that the army was ready. Moltke respected Niel and believed it was better to fight now than wait for the French to increase their manpower and modernize their weapons.[58] But the advice of Niel's successor General Edmond Leboeuf appears likewise to have been crucial for the French Cabinet.[59] Notoriously, Leboeuf affirmed that the French Army was ready 'to the last gaiter button', but he had reason to believe that reforms had made progress and that French infantry firepower had grown.[60] Like Poincaré in 1914, he feared that soon the French legislature would impose retrenchment.[61] The French also hoped that success in the first encounters would bring in Austria and Italy.[62] These forecasts proved to be completely mistaken, and whereas in 1914 Germany's military advantage really had been significantly eroded, in 1870 it had not.[63] None the less we can see again the imminence of a crossover point or power transition—one side moving downwards while the other moved up—as the dangerous time.

1887–1893

As a final example we may turn to an arms race that exhibited similar features to those of the 1910s and 1860s but did not end in war. Samuel Huntington, Grant Hammond, and Allan Mitchell have all discerned a Franco-German arms race after 1870, but they differ about its dating and on whether it merits inclusion in

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[56] Before the war of 1866 the Krupp firm had been selling artillery to both Prussia and Austria, but in 1866 Alfred Krupp agreed very reluctantly not to sell guns against the wish of the Prussian government, Harold James, *Krupp: A History of the Legendary German Firm* (Oxford, 2012), 59.

[57] Martin Kitchen, *A Military History of Germany: from the Eighteenth Century to the Present Day* (London, 1975), 123.

[58] Kitchen, *Military History*, 123; Howard, *Franco-Prussian War*, 43, 54. The Ems Despatch recorded a conversation between King Wilhelm and the French Ambassador, Count Louis Benedetti. Before releasing the text for publication, Bismarck modified it so as to make it more likely that the French would interpret it as an insulting humiliation.

[59] Richard Holmes, *The Road to Sedan: the French Army 1866–70* (London, 1984), 174; David Wetzel, *A Duel of Giants: Bismarck, Napoleon III, and the Origins of the Franco-Prussian War* (Madison WI, 2001), 121, 164.

[60] Adriance, *Last Gaiter Button*, 35.

[61] Indeed, it had already begun to do so: Howard, *Franco-Prussian War*, 39. On the Austro-Hungarian 1868 law, which set an annual quota of 95,000 and aimed at a war strength of 800,000, Rothenberg, *Army of Francis Joseph*, 80–1; Adam Wandruszka and P. Urbanitsch, eds., *Die Habsburgermonarchie, 1848–1914*, Vol. V *Die bewaffnete Macht* (Vienna, 1987), p. 489.

[62] Holmes, *Road to Sedan*, 174.

[63] For an excellent summary, Geoffrey Wawro, *The Franco-Prussian War: the German Conquest of France in 1870–1873* (Cambridge, 2003), chapter 2.

the canonical list.[64] After 1870 Franco-German diplomatic tensions persisted (war
scares occurring in 1873 and especially 1875). The French expanded their conscript
uptake by a law of 1872, though in this respect still lagged behind the Germans.[65]
They began upgrading their artillery, institutionalized strategic planning, and
strengthened their network of trunk railways leading towards the north-eastern
border. By 1890 they may have matched or even exceeded the Germans in trans-
port capacity.[66] In addition, both sides invested heavily in fortifying their new
post-1871 frontiers.[67] Other countries also adopted versions of the Prussian
recruitment system, including Austria-Hungary in 1868, Russia in 1874, and Italy
in 1871/76.[68] But apart from the French, who—as might be expected from a
defeated Power—maintained much higher equipment spending than before 1866,
the pace of military innovation in the 1870s was fairly gentle, in this reflecting a
stable diplomatic constellation in which France was isolated.[69]

From the mid-1880s, in contrast, we can see a new upsurge in army budgets,
less dramatic than that of 1910–14 but displaying common features with it.[70] In
this period too, diplomatic tension accompanied a series of army bills. Again
technological innovation was one element in spending increases, at this point
primarily due to the introduction of the small-bore repeating magazine rifle using
smokeless high-explosive propellants, which enabled a longer range and faster rate
of fire without producing smoke clouds that betrayed the marksman's location.
All the European infantries re-equipped themselves with these devices, starting
with the French Lebel rifle in 1886, and continuing with the German *Gewehr 88*
(1888), the Austrian Mannlicher (1888), the Russian Mosin (1891), and the British
Lee-Enfield (1895).[71] Smokeless powder was one aspect of a broader transition

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[64] Huntington, 'Arms Races', 43; Grant T. Hammond, *Plowshares into Swords: Arms Races in
International Politics, 1840–1991* (Columbia SC, 1993), 106–9; Allan Mitchell, *Victors and
Vanquished: the German Influence on Army and Church in France after 1870* (Chapel Hill NC, 1984);
Allan Mitchell, *The Great Train Race: Railways and the Franco-German Rivalry, 1815–1914* (New York,
2000).

[65] Challener, *French Theory*, 33–44; David B. Ralston, *The Army of the Republic: the Place of the
Military in the Political Evolution of France, 1871–1914* (London, 1967), 34–45.

[66] Stevenson, 'War by Timetable?', 175. Austria-Hungary upgraded its strategic network against
Russia in Galicia, Rothenberg, *Army of Francis Joseph*, 111.

[67] Stevenson, 'Fortifications', 841, 847–8.

[68] On Russia, John H. Keep, *Soldiers of the Tsar: Army and Society in Russia, 1462–1874* (Oxford,
1985), chapter 15; on Italy, John Gooch, *Army, State, and Society in Italy, 1870–1915* (Basingstoke,
1989), chapter 2.

[69] H. Brackenbury, 'General Sketch of the Situation Abroad and at Home from a Military
Standpoint, 3 August 1886', TNA W[ar]O[ffice]/33/46 describes a position of stable German
dominance—though the German leaders themselves were less confident.

[70] German Army spending per soldier fluctuated between 500 and 600 marks annually from 1812
to 1866, but reached 900 in 1875 and over 1,000 in 1887/88. The army budget doubled between
1886/87 and 1893/94. The army's peacetime strength rose from 427,000 in 1882/87 to 557,000 in
1893/99, Michael Geyer, *Deutsche Rüstungspolitik 1860–1960* (Frankfurt am Main, 1984), 33, 52.
The tables in William Fuller, *Civil-Military Conflict in Imperial Russia, 1881–1914* (Princeton NJ,
1985), 49–51, highlight the surges in German and Russian (though not French) military spending in
these years. Austro-Hungarian spending also jumped in 1886–88: Wandruszka and Urbanitsch, eds.,
Bewaffnete Macht, 590–1.

[71] For German fears that France was regaining the advantage, Swaine memorandum, 26 September
1887, TNA FO/881/5593.

from gunpowder to chemical explosives, which also threatened obsolescence for the brick and mortar fortresses that protected the French, German, Russian, and Austrian borders. In fact after a pause for reappraisal the continental powers continued to invest in fortification, but at more concentrated locations and with radically modified designs that centred on earth-protected installations of reinforced concrete. This, however, was not the main reason for the spending bulge.[72]

   Instead, the leading feature of the armaments race in this period too was a sequence of army laws, passed by France and by Austria-Hungary in 1889, and by Germany in 1887, 1888, 1890, and 1893. In the Balkans, Serbia and Bulgaria followed suit.[73] Italy's army budget reached its nineteenth-century peak in 1888–9, and although Russia did not pass legislation (before 1906 it had no elected parliament) it too expanded its standing army.[74] Generally the increases were smaller than in 1912–13, and the standard term of service with the colours was reduced (to three years in France and two in Germany), but these concessions to the legislatures were offset by cuts in the number of exemptions, so that the reserve of trained manpower would grow faster.[75] In Austria-Hungary the annual conscript cohort rose only by 7,500 to 103,100; but Germany's 1893 law marked the biggest increase the country had yet seen, and in France whereas previously only half the annual cohort had served for the full five-year term, now 70 per cent would serve for three years.[76] Although parliaments were more willing to pass such legislation if the service term was shortened and exemptions were diminished, military service remained fundamentally unpopular. As after 1910, therefore, a menacing external political situation was needed before governments acted. In 1886–7 German anxiety once again centred on France, where a new War Minister, General Georges-Ernest Boulanger, intensified military preparedness and made inflammatory speeches that hinted at willingness for a war of revenge. The newly founded *Ligue des Patriotes* contributed to the xenophobic mood.[77] Tension reached a climax when the Germans arrested Guillaume Schnaebelé, a French frontier agent (though later releasing him). In Eastern Europe, the Hohenzollern and Romanov dynasties had traditionally formed a common front against Polish nationalism and against revolution, but the German authorities were alarmed by the growth of anti-German sentiments in Russia and the emergence of economic and diplomatic tensions between the two countries. Germany's ally, Austria-Hungary, was at loggerheads

[72] Stevenson, 'Fortifications', 831. In Belgium, however, a major investment was made between 1888 and 1891 in constructing fortress rings round Liège and Namur, but the forts were built shoddily, insufficiently garrisoned, and not kept updated. Clayton Donnell, *The Forts of the Meuse in World War I* (Oxford, 2007), 9, 13.

[73] Fraser to Phipps, 11 September 1889, TNA FO/881/5943.

[74] The Russian Army's peacetime strength had averaged 35,000 officers and 850,000 men in 1881–85, but rose by 1894 to 35,000 officers and 940,000 men: Bruce Menning, *Bayonets before Bullets: the Imperial Russian Army, 1861–1914* (Bloomington, 1992), 108. On Italy, Gooch, *Army, State, and Society*, 58–9.

[75] C. à Court, 'Progress in the French Army in 1893'; E. Agar, 'Progress &c. in the German Army to the End of 1893', both January 1894, TNA WO/33/54.

[76] Rothenberg, *Army of Francis Joseph*, 109; Challener, *French Theory*, 60.

[77] For example, Waldersee to Bismarck, 16 November 1886, *Die große Politik der europäischen Kabinette 1871–1914* [hereafter GP], VI, doc. 1234.

with Russia over Bulgaria, where Tsar Alexander III intervened unsuccessfully to back his candidate for the throne. War against Turkey in 1877–8 had disrupted Russia's state finances, and the tsarist government had to restrict its weapons and railway spending, but it compensated by massively reinforcing its Polish frontier garrison.[78] Whereas this development caused great anxiety in Berlin and Vienna,[79] Russian intelligence was alarmed by the extent of Austrian military preparations.[80] In 1888 and 1889 Italy feared a French attack,[81] and in 1890–1 a major diplomatic turning point occurred when after years of a developing Franco-Russian rapprochement Berlin failed to renew its 'Reinsurance Treaty' with St Petersburg and the latter negotiated a defensive alliance with Paris.

   These diplomatic developments bore directly on the armaments history of the period, most evidently in Germany. Bismarck justified his 1886 *Septennat* (or seven-year army bill) as being necessary against the French threat, and eventually called an election on the issue.[82] His successor, Leo Count Caprivi, justified the 1893 law as a response to the shift in the balance in favour of France and Russia and as a means of controlling the Russians via deterrence. He too had to call a Reichstag election before he could pass the measure.[83] Duties on beer and spirits and on stock market transactions had to rise, but according to the British Ambassador, Germany's 'dislike of increased taxation [is] more than balanced by a perception of the necessity of keeping pace with the French armaments'.[84] Conversely, the French 1889 law was justified publicly on grounds of equalizing the conscription burden but also as a method of maximizing trained manpower, and the 1888–93 War Minister Charles-Louis de Freycinet introduced it as part of a complex of measures to enhance army effectiveness.[85] In the east, Russia's and Austria-Hungary's military efforts can be seen similarly as responses to the confrontation between them during the 1887 Bulgarian crisis.[86]

   [78] Between 1883 and 1893 the Russian garrison in Poland was raised from 227,000 to 610,000, a more forward deployment and higher readiness being seen as deterrents against attack: William C. Fuller, Jr, *Strategy and Power in Russia 1600–1914* (New York, 1992), 342–3.
   [79] Russell to Malet, 1 January 1891, TNA FO/881/6171; Paget to Salisbury, 11 October 1888, TNA FO/7/1135; cf. Monts to Bismarck, 7 November 1887, Deines report, 9 November 1887, *GP*, VI, docs 1150, 1151.
   [80] Fuller, *Strategy and Power*, 336; cf. Alan J. P. Taylor, *The Struggle for Mastery in Europe, 1848–1918* (London, 1971), chapter 14.
   [81] Gooch, *Army, State, and Society*, 57, 60–1.
   [82] Reichsarchiv, *Weltkrieg*, I, pp. 16–18; cf. Herbette to Flourens, 19 December 1886, 14 January 1887, *DDF*, 1ère sér., VI, docs 378, 397. Bismarck claimed the French Army was stronger than Germany's: Herbert Bismarck to Reuß, 18 December 1886, *GP*, VI, doc. 1236.
   [83] Roy Bridge and Roger Bullen, *The Great Powers and the European States System 1815–1914* (2nd edn., Harlow, 2005), 242. In 1889 the Germany Army's peacetime strength was 468,409; Austria-Hungary's 262,302; Italy's 235,069; Russia's 926,000, and France's 489,000. The War Ministry intended the 1893 law to be so large that France could not keep up—though the law proved less ambitious than envisaged, Förster, *Doppelte Militarismus*, 28, 38. For Caprivi's justification of the measure to the Reichstag, Trench to Rosebery, 25 November 1892, TNA FO/64/1275.
   [84] Malet to Rosebery, 4 July 1893, TNA FO/64/1294; Malet to Rosebery 22 October 1892 (including Wilhelm II speech), TNA FO/64/1275.
   [85] Allan Mitchell, 'The Freycinet Reforms and the French Army, 1888–1893', *Journal of Strategic Studies* 4/1 (1988), 19–28.
   [86] Fuller, *Strategy and Power*, 336; Rothenberg, *Army of Francis Joseph*, 109. Austrian Emperor Franz Joseph believed Russia's western border garrison was being 'systematically and steadily increased', Paget to Salisbury, 15 January 1889, TNA FO/7/1146.

In all these respects, similarities are evident with the European conjuncture at the time of the emergence of the pre-First World War land armaments race between 1908 and 1912.

In contrast to the later period, however, this intensification in the arms race did not culminate in hostilities. In 1870 and in 1914 the Berlin leaders went to war at a moment when their military superiority seemed to be coming under challenge, by French rearmament and by Franco-Russian rearmament respectively. In the late 1880s the German military chiefs had similar fears of being overhauled: the elder Moltke had advocated preventive war against France in 1875 and against Russia in 1887. But Bismarck overruled him on both occasions, and enjoyed the emperor's backing. The chancellor resisted launching a preventive war, even when (as in the winter of 1887–8) he was almost completely isolated. He maintained instead that rearmament could keep the peace.[87] He was assisted by disagreements within the military establishment over whether the army should be expanded to meet foreign challenges even if this weakened its internal reliability. Moreover, Moltke publicly doubted by 1890 whether short, sharp victories over major powers were still possible.[88] French fortress building seemed to rule out another quick invasion of France, and the general staff increasingly doubted whether rapid success was possible against Russia. After 1890 the solution devised by Alfred von Schlieffen as CGS would be to outflank the French fortresses by attacking the less formidable Belgian ones, but that concept was incorporated into the concentration schedules only after 1905.[89] In the absence of a viable offensive strategy, the purpose of Bismarck's and Caprivi's rearmament became to reinforce deterrence.

On the other side, France and Russia were relatively easy to deter. It is true that their general staffs saw the Caprivi Law as strengthening Germany's offensive power, and as a consequence the Russians agreed not only to an alliance with France but also to a military convention.[90] But the Boulangist movement collapsed in 1889 and in the following decade the growth of French military spending decelerated.[91] Both the financial and the demographic effort entailed (given France's much lower birth rate than Germany's) had reached the maximum that was politically feasible, and the 1889 Freycinet Law like the 1893 Caprivi one would take many years to maximize the pool of trained manpower.[92] In contrast, Russia's spending continued to grow, and an economic boom during the 1890s expanded the funding available for tsarist rearmament. Much of this extra increase, however, was directed towards Asia rather than Europe. After 1887 there were no

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[87]   Michael Schmid, *Der 'Eiserne Kanzler' und die Generäle: Deutsche Rüstungspolitik in der Ära Bismarck (1871–1890)* (Paderborn, 2003), chapter 9. I am indebted to Thomas Otte for this reference. For a classic exposition of Bismarck's deterrence doctrine (and his belief that Germany's deterrent capability had been dwindling), see his 6 February 1888 Reichstag speech, text in TNA FO/881/5601.

[88]   Förster, 'Facing People's War', 220–5.

[89]   Ehlert, et al, eds., *Der Schlieffenplan*, 397, 411.

[90]   Fuller, *Strategy and Power*, 353–60.   [91]   Crouzet, 'Recherches', 57.

[92]   C. à Court, 'Progress in the French Army in 1893'; E. Agar, 'Progress &c. in the German Army to the End of 1893', both January 1894, TNA WO/33/54.

more major Balkan crises for two decades, and in 1897 Russia and Austria-Hungary reached an agreement to place the Near East 'on ice': in other words to respect the status quo.[93] The Franco-Russian alliance should not be seen as changing this picture, as its origins lay in France's and Russia's shared hostility to Britain as well as to Germany. Between 1884 and 1904 they were engaged in a building contest with the Royal Navy, to which the 'two-power standard' embodied in the 1889 Naval Defence Act and in subsequent construction programmes constituted London's response.[94] During the 1890s the most serious diplomatic crises occurred not in the Rhineland or the Balkans but outside Europe, where Britain clashed with France, Germany, and Russia in Africa and East Asia. By 1897–8 Germany's land situation was so favourable that Wilhelm II could embark on a major naval armaments effort against Britain while the German Army's peacetime strength remained virtually static. In other words, the 1887–93 land armaments race ended in relative stability at a higher level of preparedness, in part because both sides remained deterred, but also because the late 1880s diplomatic crises lacked longer-term repercussions, Caprivi commenting by 1890 that there was no imminent danger of war.[95] It was this stability that Russia's collapse after 1904, and the associated new run of diplomatic crises, would overturn.

CONCLUSION

This chapter has investigated three examples of land armaments races. In each case German military superiority was challenged by France or by France in association with others. All three races were partly technological, qualitative competitions, although that of 1866–70 most so and that of 1910–14 least: which gives mixed endorsement to Huntington's thesis that quantitative races are the most dangerous.[96] In all three cases public support for extended conscription was feeble, although it strengthened partly as a consequence of armaments expansion. However, domestic resistance seems to have constrained France more than Prussia in the 1860s, both sides about equally in the 1880s and 1890s, and the Central Powers more than their opponents in 1910–14. The role of lobbying by a 'military-industrial complex' seems to have been small, and less significant for land than for naval armaments.[97]

These arms races must be seen in relationship to others, and terrestrial and maritime armaments competition viewed in conjunction. Until the 1860s France was engaged in naval rivalry with Britain, although in 1866 it belatedly switched its

[93] Taylor, *Struggle for Mastery*, 370.

[94] The classic account is Arthur J. Marder, *The Anatomy of British Sea Power: a History of British Naval Policy in the Pre-Dreadnought Era, 1880–1905* (reprinted London, 1964). See the reappraisal in Matthew S. Seligmann, 'Britain's Great Security Mirage: the Royal Navy and the Franco-Russian Naval Threat, 1898–1906', *Journal of Strategic Studies* 35/6 (2012), 861–86.

[95] Förster, *Doppelte Militarismus*, 38; Caprivi said the same to the Reichstag, presenting the bill as a precautionary measure to enable a defensive war on two fronts: Trench to Rosebery, 5 May 1893, TNA FO/64/1294.

[96] Huntington, 'Arms Races', 76, 79.   [97] Marder, *Anatomy*, chapter 3.

attention back to land armaments. In the 1880s and 1890s France and Russia again challenged the Royal Navy, thereby limiting their resources available against the Central Powers. Conversely, after 1897, and especially after 1908, Germany prioritized its naval contest with Britain at the expense of its army (while Austria-Hungary after 1904 engaged in naval rivalry against Italy). Only with the *Rüstungswende* of 1911–12 did Germany re-emphasize land armaments, but now in circumstances where its alliance bloc's advantage was dwindling rapidly, and dwindling still more rapidly after the Balkan Wars.

Most weight has been given here to the action-reaction model as an explanatory framework, while underlining its inadequacies if divorced from its diplomatic and political context. Whereas both the 1866–70 and 1910–14 races developed suddenly, after the Austro-Prussian War and the Russian military reorganization (bearing out another Huntington insight—that the initial phases are the riskiest), that of 1897–93 reflected a more gradual intensification of established tensions. None the less, in Bismarck's words, 'War never explodes like a lightning bolt; it is always preceded by grave antagonisms...'[98] One conclusion from the analysis might seem that armaments competition is most destabilizing at the point of crossover or power transition when one side threatens to overhaul the other.[99] This finding should direct attention towards other impending crossover points, as when Britain and France closed in on Germany in the late 1930s, when the United States surged ahead of the Soviet Union in the early 1960s, and perhaps as the PRC narrows the gap with the United States today.[100] In all these instances we see not a stable equilibrium but an unstable one with one side moving up and the other moving down—or at least according to both sides' perceptions. Such conjunctures have not, however, invariably ended in hostilities: and although in both 1870 and 1914 the Germans acted to forestall a crossover, in the 1880s they were inhibited from doing so. Moreover, even in spring 1914 the Berlin leaders were still considering non-violent alternatives such as new rounds of railway or fortress construction (or intensified conscript call-ups) that might preserve their military advantage. They were not compelled to react so forcefully after the Sarajevo assassinations, any more than the French were compelled to after the Ems Despatch. In considering why wars break out, therefore, arms races must always be placed within their political context. They have a vital—and unjustly neglected—part to play in explaining fateful events, but they provide far from the whole story.

ACKNOWLEDGEMENTS

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[98] ('La guerre n'éclate jamais comme un coup de foudre; elle est toujours précédée de dissentiments graves...'), Herbette to Flourens, 12 March 1887, *DDF*, 1ère série, VI, doc. 479.

[99] For the starting point on 'power transition theory', Abramo Organski, *World Politics* (2nd edn., New York, 1968).

[100] Cf. figures 2 and 4 in this volume; Richard Neustadt and Ernest May, *Thinking in Time: the Uses of History for Decision Makers* (New York, 1988), 124–5 (for 1962); and 'The Dragon's New Teeth', *The Economist*, 7 April 2012 (for China/US).
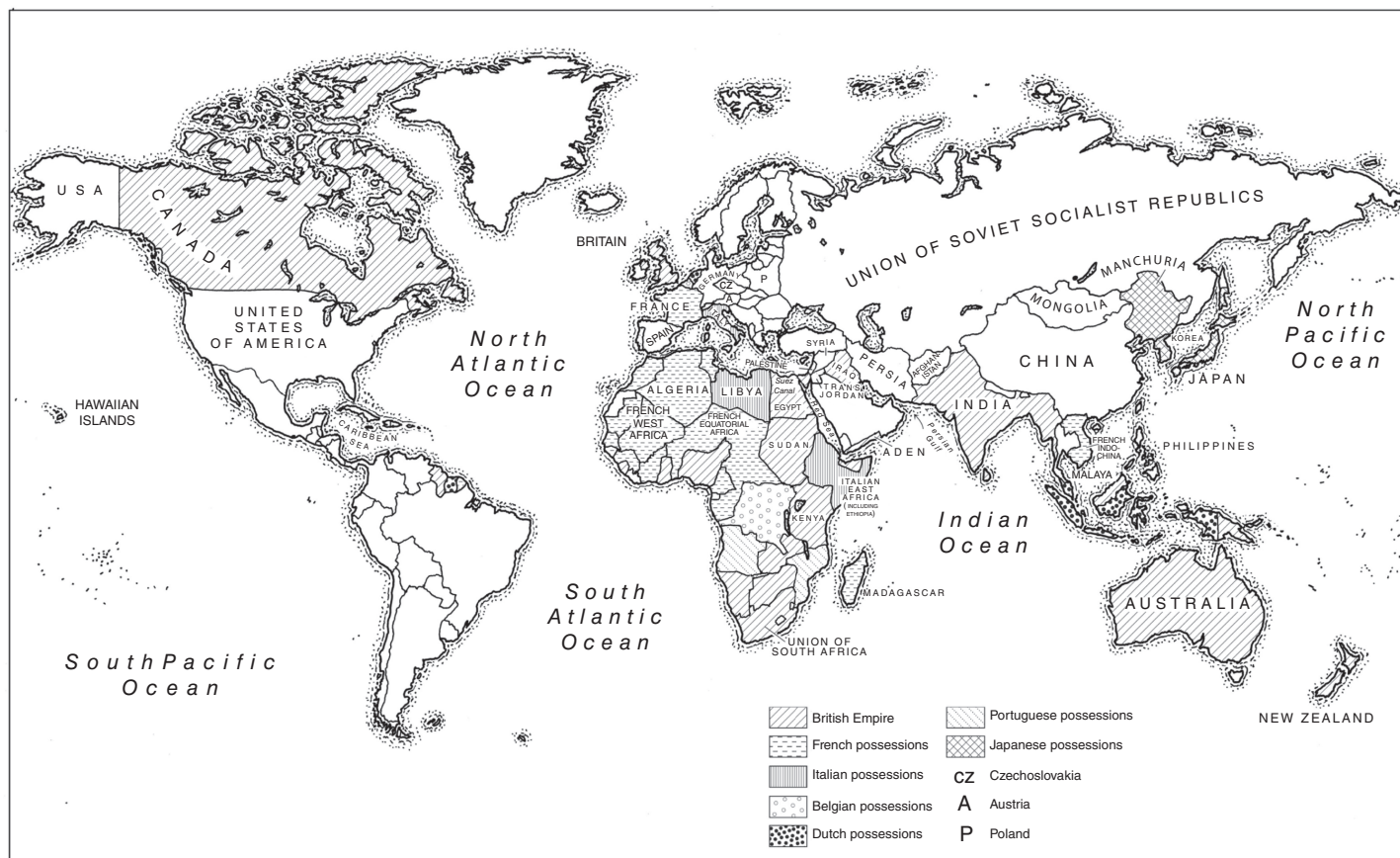
Map 2. The Great Powers in 1937

USA

CANADA

UNITED STATES OF AMERICA

BRITAIN

HAWAIIAN ISLANDS

North Atlantic Ocean

CARIBBEAN SEA

South Atlantic Ocean

South Pacific Ocean

FRANCE

SPAIN

GERMANY

CZ

P

A

ALGERIA

LIBYA

FRENCH WEST AFRICA

FRENCH EQUATORIAL AFRICA

SYRIA

PALESTINE

TRANS-JORDAN

Suez Canal

EGYPT

IRAQ

PERSIA

AFGHAN-ISTAN

Persian Gulf

SUDAN

ADEN

ITALIAN EAST AFRICA (INCLUDING ETHIOPIA)

KENYA

MADAGASCAR

UNION OF SOUTH AFRICA

UNION OF SOVIET SOCIALIST REPUBLICS

MONGOLIA

MANCHURIA

KOREA

CHINA

JAPAN

INDIA

FRENCH INDO-CHINA

MALAYA

PHILIPPINES

Indian Ocean

North Pacific Ocean

AUSTRALIA

NEW ZEALAND

British Empire

French possessions

Italian possessions

Belgian possessions

Dutch possessions

Portuguese possessions

Japanese possessions

CZ Czechoslovakia

A Austria

P Poland

PART II

BETWEEN THE TWO WORLD WARS

Introduction

Joseph Maiolo

The First World War marked a profound change in the way military planners thought about war. Before 1914 general staffs assessed the strength of nations by measuring the size and quality of armies and fleets and the money spent on them. In 1914 Europe's armies advanced according to offensive plans intended to achieve swift and decisive results. The war, however, lasted for four terrible years and demanded an unprecedented commitment of national resources and ever-greater mobilization of entire economies and societies by the combatant governments.

This change in the character of war from a clash between armies and navies to a national endurance test, or 'total war' as it became known, framed the way contemporaries interpreted the outcome of the conflict and the way in which they imagined wars to come. Germany and its allies had lost the war, so ran the conventional wisdom, not because Germany's armies had been defeated, but because the Central Powers' economies had failed and the morale of their populations had collapsed, owing in part to the Allied blockade. The lesson that military men the world over drew from the war of 1914–18 was repeated time and again at staff colleges and in scholarly studies: winning the next war would require extensive pre-war planning to mobilize the totality of the nation's industrial and human resources, as well as self-sufficiency (autarky) in food and in key raw materials such as iron ore, coal and oil.[1] In other words, the definition of 'armament' had expanded to encompass not only front-line forces (arms *in breadth*), but also the readiness and the capacity of entire economies and societies to wage total war (arms *in depth*).[2]

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[1] See for instance Norman Angell et al., eds., *What would be the Character of a New War?* (London, 1933); for a survey of the inter-war literature see E. M. Rosenbaum, 'War Economics: A Bibliographical Approach', *Economica* 9, 33 (1942), 64–94.

[2] Georg Thomas, *Geschichte der deutschen Wehr-und Rüstungswirtschaft, 1918–1943/45* (Boppard, 1966), 489.

   This expansive concept of 'armament' shaped the security environment of the inter-war years. Although the victors of 1919 tried to stabilize international politics in the 1920s with collective security and the promise of disarmament through the League of Nations, the divide between those powers with the greatest capacity for industrial total war and those with limited military-economic potential was an underlying source of tension throughout the period.[3] (See Figure II.1 for a contemporary view of the resource balance.) The long drawn-out attempt to negotiate limitations on land and in the air forces underscored the problem. During the 1920s committees of technical experts convened by the League of Nations in Geneva debated how to reduce the world's armaments to the minimum required to uphold collective security. The disarmament negotiations were plagued by political and technical disputes.[4] One key difficulty was the question of what the powers should agree to limit in order to promote global security: the number of men in uniform, the number of trained reservists, certain types of weapons, or military spending? As Joseph Maiolo shows below in Chapter 4, the major sea powers averted a naval arms race by agreeing to limit the strength of their fleets according to maximum tonnages in each category of warship. However, unlike surface naval vessels such as battleships, aircraft carriers, and cruisers (which took three to six years to build and bring into service), armies and air forces could be expanded rapidly in wartime. The step from great industrial potential to great land and air forces appeared to be only a matter of pre-planning and organization. Limiting the size of armies and air forces therefore enhanced the strategic advantage of the powers rich in population, territory, industry, and most raw materials (the United States and the British and French Empires). That disarmament reinforced the global *status quo* was not lost on those powers (Germany, Italy, and Japan) that lacked the overseas territories and domestic resource base that military men everywhere equated with national security. Acutely aware that their country was rich in natural resources but backward in industrial development, Soviet representatives at the world disarmament talks called for the total abolition of armed forces while back at home their colleagues laid out the plans for a crash-programme of forced industrialization. When Red Army staff officers surveyed the strategic balance in the late 1920s, they calculated that French, British, and American automotive industries could swiftly switch to tank and aircraft output on a vast scale, and concluded that the Soviet Union needed the economic depth to match them.[5] As Soviet economic planners would later learn, converting civilian plant to war production was much more complex and difficult than these early projections

   [3] Richard J. Overy, 'Economics and the Origins of the Second World War', in Frank McDonough, ed., *The Origins of the Second World War: An International Perspective* (London, 2011), 482–506. For a contemporary analysis of the strategic divide in raw material distribution, see Brooks Emeny, *The Strategy of Raw Materials: A Study of America in Peace and War* (New York, 1934), 1–37. See also William E. Rappard, *The Common Menace of Economic and Military Armaments* (London, 1936).
   [4] Andrew Webster, 'From Versailles to Geneva: The Many Forms of Interwar Disarmament', *Journal of Strategic Studies* 29/2 (2006), 225–46.
   [5] Joseph A. Maiolo, *Cry Havoc: How The Arms Race Drove The World To War, 1931–1941* (New York, 2011), 7–21.
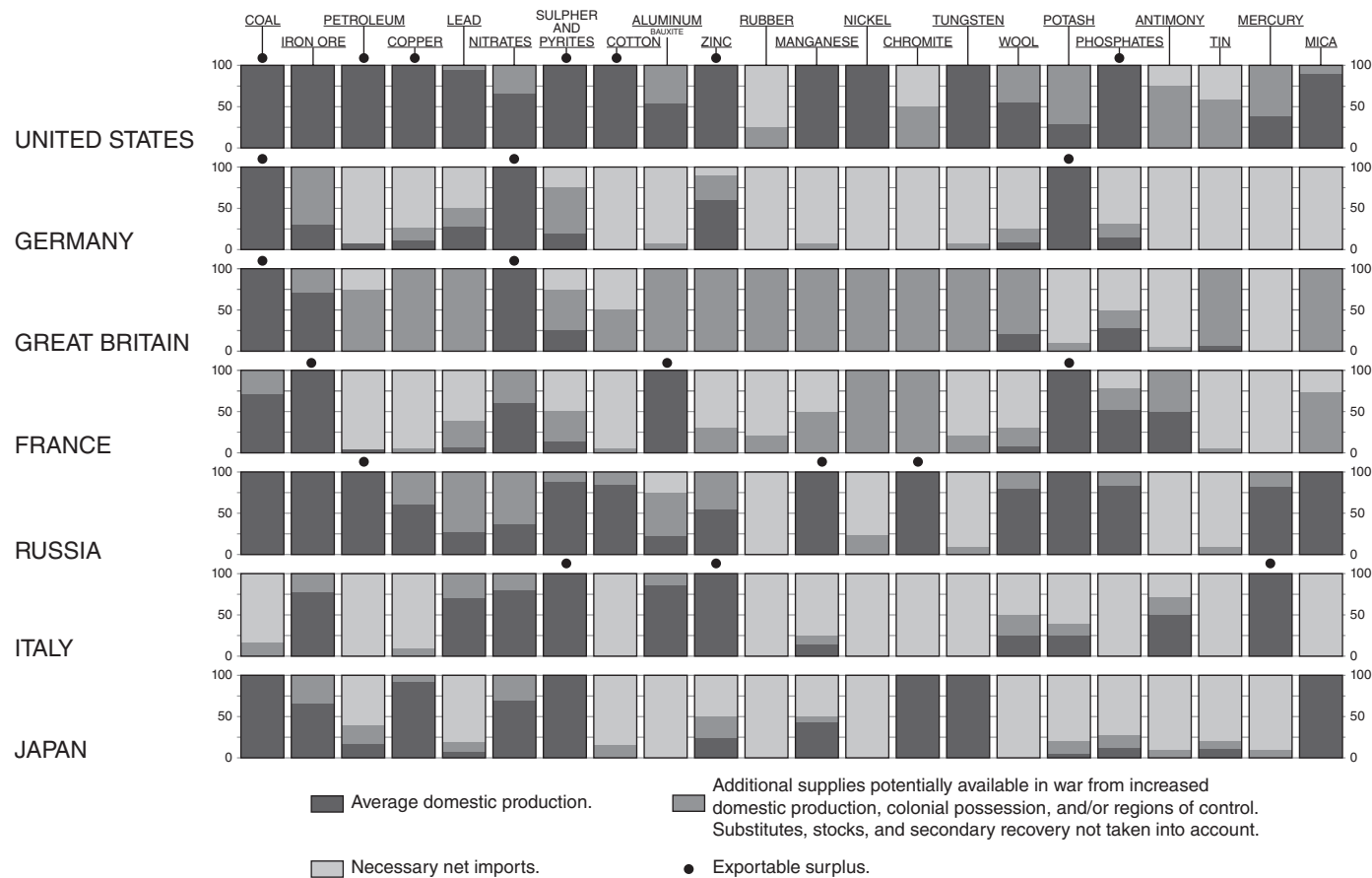
Figure II.1. Strategic Situation of the Great Powers: Potential Wartime Self-Sufficiency in Essential Industrial Raw Materials (1934)

Source: reproduced from Brooks Emeny, *The Strategy of Raw Materials: A Study of America in Peace and War* (New York, 1934), 169.

Table II.1. Defence Expenditure of the Great Powers, 1931–1940 (in millions in each national currency)

	Britain (pounds sterling)	France (francs)	Germany (reichsmark)	Italy (lire)	Soviet Union (ruble)	United States (dollars)	Japan (yen)
1931	107.5	13,852	610	5,034	1,790	733	434
1932	103.3	13,814	720	5,049	4,034	703	733
1933	107.6	13,431	750	4,575	4,299	648	873
1934	113.9	11,601	4,093	5,317	5,393	540	955
1935	137.0	12,800	5,492	12,108	8,174	711	1,032
1936	185.9	15,101	10,271	13,078	14,858	914	1,105
1937	256.3	21,580	10,963	12,282	17,481	937	3,953
1938	397.4	29,153	17,247	13,446	23,200	1,030	6,097
1939	719.0	93,687	38,000	24,689	39,200	1,075	6,417
1940	2,600.0		55,900	63,235	56,752	1,498	7,266

Notes: Fiscal years are adjusted to calendar years. Government defence expenditure is expressed above in national currencies because they were not convertible or stable in value in the 1930s. It is therefore misleading to produce a similar graph to the one presented in this volume for pre-1914 defence spending or the table for post-Cold War defence spending. The above figures are, however, indicative of the rate and scale of change in competitive arms expenditure.

Sources: Richard J. Overy with Andrew Wheatcroft, *The Road to War* (London, 1999), 368; Robert Frank[enstein], *Le Prix du réarmement français, 1935–39* (Paris, 1982), 304; Cristiano A. Ristuccia, *The Italian Economy under Fascism, 1934–43* (DPhil Thesis, University of Oxford, 1999), 40; R. W. Davies and Mark Harrison, 'Defence Spending and Defence Industry in the 1930s', in John Barber and Mark Harrison, eds., *The Soviet Defence-Industry Complex from Stalin to Khrushchev* (Basingstoke, 1999), 73.

assumed. None the less, as the speed and scale of US mobilization in 1940–1 would show, the wealthy economies did possess a great potential for war if they had the time to mobilize adequately.[6]

By the time the world disarmament conference met in Geneva in February 1932, the world was in the throes of the Great Depression. The economic turmoil widened the divide between the 'haves' and 'have nots' and propelled into positions of power and influence in the latter powers military, industrial, and political elites that sought radical solutions to their national economic and security problems. In September 1931, the Japanese Army seized the resource-rich region of Manchuria in order to turn it into a vast military-industrial complex in reply to the Soviet Union's first Five Year Plan.[7] In 1932–3, the German Army welcomed Hitler's rise to power because the Nazis promised to mobilize the economy for rearmament and to impose national cohesion in ways that conformed to their vision of total wars to come. Thus, while diplomats in Geneva searched for minimum numbers of tanks, guns, and planes to insert in the blank tables of the draft disarmament treaties, staff officers in Japan, Germany, the Soviet Union, and Italy

[6] Mark Harrison, 'Why the Wealthy Won: Mobilisation and Economic Development in Two World Wars' in Mark Harrison, *The Economics of Coercion and Conflict* (London, 2014), 67–98.
[7] Michael A. Barnhart, *Japan Prepares for Total War: The Search for Economic Security, 1919–1941* (New York, 2013).

planned to organize their national economies to produce munitions on a grand scale.[8] The breakdown of the gold exchange standard currency mechanism, the formation of protectionist economic blocs, and the demise of the post-war political order enabled them to do so. In 1933, Japan and Germany left the League of Nations. In July 1934, the Geneva disarmament conference adjourned. In 1934–5, Germany began to rearm at full speed in defiance of the limits imposed on the size of its armed forces in 1919 by the Treaty of Versailles. In March 1935 Germany introduced conscription and Hitler unveiled the *Luftwaffe*. In 1935–6, Britain and France replied with large rearmament programmes of their own.

As the chapters in this section show, military competition between the great powers between 1936 and 1941 took the form of multiple air, land, and naval races. Yet the arms race also took on a more all-encompassing form. In accord with the military theory of the day, arming meant not just expanding the armed forces, but also organizing the economy to maximize military production and regimenting the people to bear the deprivations of reduced living standards in peacetime and total war. Future war would be 'totalitarian war'. For the revolutionary movements of the right and left as well as elements of the Japanese political and military elite, mass mobilization to realize grand political visions and to wage total war was central to their ideologies. As Evan Mawdsley shows for the revisionist states, the growth of their armies was tied to the ideological impulse to achieve economic and military security through conquest. Military men everywhere, however, saw disciplined populations and command economies as logical preconditions for arming for total war. For the liberal great powers, the arms race thus had far-reaching political implications. To place their economies on a wartime footing to match the effort of the totalitarian powers, especially in land forces, required suppressing markets in favour of central planning and meant curbing individual liberties: in other words succumbing to totalitarianism.[9] The crisis in market capitalism and democracy prompted by the Great Depression in the first half of the 1930s only served to heighten the fear of an inadvertent slide into totalitarianism as a result of the intensifying arms race.

One way for the liberal great powers to escape this emulate-or-capitulate dilemma was to deter the aggressors with strategies based on limited armaments. Since the British and French Empires had far greater industrial, financial, raw material, and human resources than Germany, even if the latter were allied to Italy, they were bound to win a long war. The goal of their strategies was therefore to convince Berlin that it could not win a short war, by arming enough to defeat any German attempt to win quickly. Air forces offered statesmen a powerful new tool for this purpose (see Figure II.2). The British government attempted to deter Hitler by building up first a bomber force and then, from 1938, fighter defences. In a similar way, the French hoped that the Maginot Line of frontier fortifications would convince the German general staff that it could not win a swift war against France and would therefore face a prolonged conflict against the mobilized strength

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[8] Maiolo, *Cry Havoc*, 39–81.　　[9] This is a central theme of Maiolo, *Cry Havoc*.
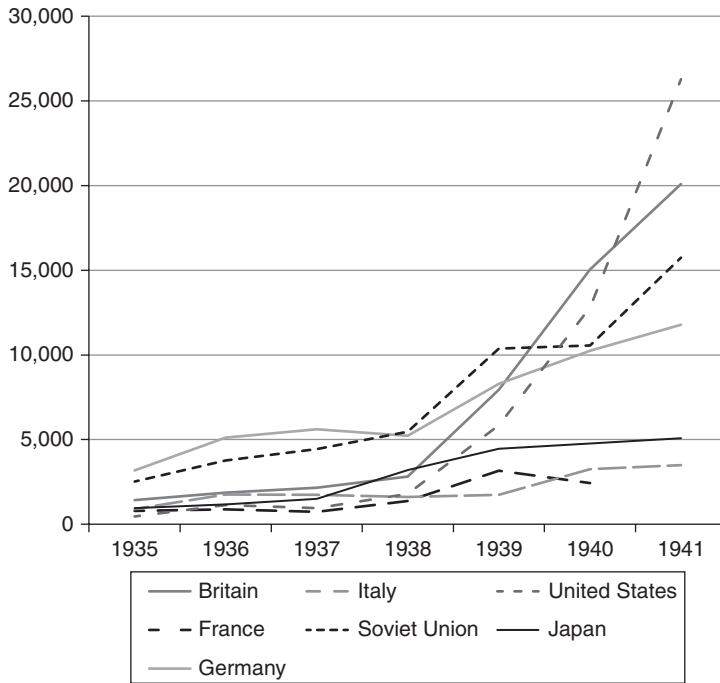
Figure II.2. Military Aircraft Production of the Great Powers, 1935–1941
Source: Richard J. Overy with Andrew Wheatcroft, *The Road to War* (London, 1999), 369.

of the British and French Empires.[10] As Richard Overy points out in Chapter 3, bombers not only offered statesmen a new deterrent, but also inspired deep anxiety by raising the possibility that an attacker might launch a knock-out blow from the sky. Such fears were grossly inflated, however, because German planners never envisaged using the *Luftwaffe* in such a way.

   Although the arms race in Europe is often cited as the classic example of a failure to arm early enough to deter aggression, the dynamic of military rivalry in the 1930s was more complex. In London and Paris, the apparent failure of Western deterrence strategies to compel Hitler to halt the arms race resulted in accelerated defence schemes and, especially in France, reforms to the munitions industries. By 1938–9, the scale of arming in Britain and France had reached levels that decision makers predicted could not be sustained for long within the constraints of a free-running peacetime economy. To allocate more resources to arming, as one senior official in London put it, would require turning Britain 'into a different kind of nation'.[11] Yet the predilection to credit the totalitarian states generally, and the Nazi regime in particular, with superior efficiency was misplaced. By 1937–8,

[10] *Ibid.*, 81–103, 159–85, 211–68.
[11] The National Archive, Kew, United Kingdom, CAB[inet Papers] 23/93, Cabinet meeting, 6 April 1938.

constrained by the need to export to pay for imports of raw materials, German rearmament had reached its peacetime limits.[12]

Instead of bringing Hitler to heel, however, the rapid growth of British and French armaments and the slowdown of German rearmament convinced him that time was running out for a quick war against Czechoslovakia. The possibility of such a conflict provoked protests from the German Army, which argued that it would result in a long war against a coalition with a crushing superiority in resources.[13] Such considerations played on Hitler's mind when he was deterred from attacking Czechoslovakia in September 1938. Afterwards, he ordered a huge expansion of the army, navy, and air force that ran up, however, against the same balance-of-payments constraint that had curbed earlier German efforts. The Munich crisis, meanwhile, had spurred not just Britain and France, but also the Soviet Union and the United States to step up their armaments programmes. As each of the three chapters in this section point out, the navy, air, and land rivalries did not directly cause war to break out in September 1939, but the larger race in the mobilization of economic resources for armaments did play a role. In 1939 Hitler realized that that arms race was spiralling well beyond Germany's ability to win it. As a consequence, he decided to attack Poland and run the risk of a larger war against a coalition of enemies that possessed an overwhelming superiority in military and economic resources.

The coming of war did not solve the disparity in armaments between Germany and its foes. Even the rapid and unexpected defeat of France in the summer of 1940 did nothing to alter the overall strategic balance between Germany and the coalescing anti-Axis alliance. Sudden shifts in arms priorities caused by Germany's rapidly changing strategic predicament prevented the efficient exploitation of the resources at hand. In 1941 the German leadership saw itself caught between an emerging Anglo-American alliance and the rapidly arming Soviet Union. Germany attacked the Soviet Union in June 1941 to knock the latter out of the equation and conquer its resources for war against the United States and Britain. From November 1938 to 1941, Washington saw the problem of rearmament in the same way as London and Paris had done earlier. The issue was how to deter the Axis powers without mobilizing the US economy and people on a totalitarian scale. After the Munich crisis, President Franklin D. Roosevelt endorsed a policy of containment through the massive build-up of air forces. The US, he argued, would offer Britain and France the aircraft to deter Berlin, and if that failed, to destroy Germany. This strategy failed when France fell in the summer of 1940. After Germany invaded Russia, the White House came under increasing pressure to mobilize US industry

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[12] Adam Tooze, *The Wages of Destruction: The Making and Breaking of the Nazi Economy* (London, 2007), 244–325.

[13] On 5 May 1938, the chief of staff of the German Army, General Ludwig Beck, described the German situation in stark terms: 'The military-economic situation of Germany is bad, even worse than in 1917/18. For this reason Germany does not have the capacity to win a long war.' See Klaus-Jürgen Müller, *General Ludwig Beck: Studien und Dokumente zur politisch-militaerischen Vorstellungswelt und Taetigkeit des Generalstabschefs des deutschen Heeres 1933–1938* (Boppard am Rhein, 1980), 502–62.

to speed up the expansion of all three armed services.[14] For Roosevelt the choice between building an isolationist fortress America or ordering a huge programme of arms expansion in order to supply the US and its future allies with the means to roll back the Axis alliance was no choice at all. A cold war against a totalitarian-controlled Eurasia would destroy the American way of life, because 'to survive in such a world', Roosevelt concluded, the US would have to convert itself 'permanently into a militaristic power on the basis of war economy'.[15]

  The fear that a prolonged military-economic competition with totalitarian foes would compel the US to buy security at the cost of liberty was a lasting legacy of the inter-war arms race that shaped early American Cold War thinking. In February 1946, for example, George F. Kennan wrote that 'the greatest danger that can befall us in coping with this problem of Soviet communism, is that we shall allow ourselves to become like those with whom we are coping'.[16] President Dwight D. Eisenhower, who as a young army major in the 1920s helped to draft an industrial mobilization plan and forty years later would warn Americans of the spectre of the 'military-industrial complex', likewise feared that spiralling defence expenditures driven by a desire for total security would 'compel us to imitate the methods of the dictator...[and] to devote our nation to the grim purposes of the garrison state'.[17] His solution was to rely on the threat of massive nuclear retaliation as a cheap means of deterring Soviet aggression in any form.[18] And as we shall see in the next section, the nuclear arms race would remain a central feature of the Cold War until the collapse of the Soviet Union at the end of the 1980s.

[14] Maiolo, *Cry Havoc*, 303–13, 371–85.
[15] Samuel I. Rosenman, ed., *The Public Papers and Addresses of Franklin D. Roosevelt*, 13 vols. (New York, 1941–50), ix, pp. 633–44, 663–72.
[16] Gregory Mitrovich, *Undermining the Kremlin: America's Strategy to Subvert the Soviet Bloc, 1947–56* (New York, 2000), 3–8.
[17] James Ledbetter, *Unwarranted Influence: Dwight D. Eisenhower and the Military-Industrial Complex* (New Haven, 2011), 37–41.
[18] Robert J. McMahon, 'U.S. National Security Policy from Eisenhower to Kennedy', in Melvyn P. Leffler and Odd Arne Wested, eds., *The Cambridge History of the Cold War: Volume 1. Origins* (Cambridge, 2010), pp. 288–303.

3

Land Armaments, 1919–1941

Evan Mawdsley

'Oho! The Pope! How many divisions has *he* got?'[1] This early comment on soft power versus hard power, attributed to Joseph Stalin in May 1935, represents one cynical view of the 'arms dynamic' in the run-up to the Second World War. It typifies, too, a perception of the primacy of *land* armaments within that dynamic—at least for some countries and for some national leaders.

   In this chapter excessive use of the term 'arms race' will be avoided. It seems to describe too much of an *event*, and would be better thought of as a *process*. Following Barry Buzan and Eric Herring, I find useful the much broader term 'arms dynamic', which takes in 'the entire set of pressures that makes [states] both acquire armed forces and change the quantity and quality of the armed forces they possess'. It is also valuable to see the outcome of the specific arms dynamic as a graduated one—from 'maintenance of the military status quo', to 'arms competition' (or 'build-up'), and only in extremity developing to the level of 'arms racing'.[2] All three levels can be found in relation to land armaments in the inter-war world before 1939/1941.[3]

LAND ARMAMENTS: COMPLEXITIES AND IMPORTANCE

The discussion here of land armaments in the inter-war period involves special and interesting complexities. First of all, it is one of two chapters in the present volume devoted specifically to *land* armaments. Complementary—and potentially over-lapping—papers will deal with both naval armaments *and* air armaments in the

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[1] Winston S. Churchill, *The Second War*, I (London, 1949), 121. The source and truthfulness of this often-cited quote remains unclear. Following the signature of the Franco-Soviet Treaty of Friendship and Mutual Assistance Pierre Laval, then French Minister of Foreign Affairs, travelled to Moscow for talks with Stalin. After a discussion about how many French divisions would be available to face the Germans on the Western front, Laval asked whether the treatment of the Catholics in Soviet Russia would be improved, to obtain the diplomatic support of the Pope. It was at this point that Stalin was said to have posed his sarcastic question. Churchill maintained that the quotation was a 'fragment not hitherto published'.

[2] Barry Buzan and Eric Herring, *The Arms Dynamic in World Politics* (London, 1998), 81.

[3] The shorthand '1939/1941' is used here, to stress that not everyone went to war in September 1939.

1930s; the discussion of the situation before 1914 has papers only on armies and navies (there were, of course, no air forces).[4] Land armaments were especially important in this period. In the major European 'continental' powers—France, Germany, and the USSR—the most important elements of the military bureaucracy were the leaders of the armies, and the traditions of the ground forces were strongest. In Britain, Italy, and the United States, and perhaps in Japan after December 1941, the situation was admittedly somewhat different, in that naval or air forces had considerable weight and influence.

 Land armaments would turn out to be the main war-fighting instrument of the aggressor states in Europe and Asia. It was the German Army—rather than the *Luftwaffe* or the Navy—that allowed the Third Reich in 1939–42 to gain control of much of the European continent. If one takes a longer view of the Second World War (including the Sino-Japanese War), land armaments were also predominant in Japanese aggression in China in 1937–41. The development and outcome of the Second World War in Europe were determined by the performance of the respective ground forces, notably the failure of the French and Russian armies in 1940 and 1941, the flood tide of the Red Army in 1943–5, and the advance of the British and American armies after June 1944.

 The word 'armaments' is also not altogether suitable when discussing the expansion of armies, as it suggests *equipment*—in this case, for example, rifles, machine guns, artillery pieces, tanks, and the like—rather than *personnel*.[5] It is true that the Covenant of the League of Nations used the term 'national armaments' to refer to military forces in general (in the context of the desirability of their reduction). However, at the Geneva 'Conference for the Reduction and Limitation of Armaments', held between 1932 and 1934, the categories of 'effectives' (i.e. personnel) and 'land material' were discussed separately.[6] International competition in the parallel categories of navies and air forces (parallel to armies) has indeed been measured largely in terms of equipment—so many vessels of each type, so many aircraft or squadrons. The number of sailors or aircrew has not been a central statistic. Navies and air forces were capital-intensive; armies were still labour-intensive. The strength of an army was affected not only by the amount of equipment it had available but also by the number of personnel in the ranks, and this in turn was influenced by factors like length of national service and the availability of trained reserves.

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 [4] I would suggest, however, that isolating the *specific* element of land armaments is one of the justifications for including the present chapter in this volume. Joseph Maiolo has written an excellent study of the 1930s arms race *as a whole* in the form of *Cry Havoc: The Arms Race and the Second World War, 1939–1941* (London, 2011). Earlier Maiolo had identified three 'constituent' naval, air, and 'airland' races: 'Armaments Competition', in Joseph A. Maiolo and Robert Boyce, eds., *The Origins of World War II: The Debate Continues* (Basingstoke, 2003), 293–7.

 [5] The relevant modern definition of 'armaments' in the *Oxford English Dictionary* is 'military equipments, munitions of war'. A better term, in the present context, taking in personnel *and* equipment ('armaments'), might be 'ground forces'.

 [6] Covenant of the League of Nations at: http://avalon.law.yale.edu/20th_century/leagcov.asp; 'Preliminary Report on the Work of the [Geneva] Conference', July 1936: http://digital.library.northwestern.edu/league/le00089a.pdf.

Before both world wars a major feature of the 'arms race' was the increase in the period of time conscripts were obliged to serve in the ranks of the army; an increase from one to two years service was recognized as a major increase in national military potential.[7] Again, in the 1930s British and French calculations about the strength of the German Army after 1935 placed great weight on estimates— sometimes wildly inaccurate ones—of the number of reserve formations available.[8] Armies, especially mobilized armies, also took up a much larger proportion of the national population—and of the potential national (civilian) labour force—than did the other services. Indeed, in some countries—Italy is perhaps the extreme case—demography was regarded by governments as a crucial factor in assessing national strength.[9]

A related difficulty in the inter-war period is ascertaining which categories of 'armaments' (or equipment) relate to 'land' warfare; the situation was certainly more straightforward before 1914. Especially complex was the role of aircraft. There was a separate and important competition in air armaments in the 1930s, in which the Germans were feared to be developing an air force capable of 'independent' action (against cities rather than providing ground support to armies).[10] However, the leaders of the armies (if not of the air forces) also rightly regarded aviation as an important factor in future land warfare. Aircraft were seen—like tanks—as a weapon of a modern army.[11] The Russians in the 1930s saw aircraft— fighters and light bombers—as playing a vital role in preventing the concentration of enemy land forces, and facilitating 'deep' offensive operations by the Red Army. Similarly, the Germans used tactical aviation with great effect in the early land campaigns of the war.[12]

More problematical still in this period is separating the specific acquisition of land armaments from 'armament in depth' (or 'total-war' preparations). If a country is producing steel or rubber, or stockpiling petroleum products (or investing in steel mills, or plants producing synthetic oil or rubber), is this development to be seen as *especially* relevant to land armaments? Armament in depth and notions of national mobilization related to all three services (the balance

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[7] Of course, an increase in the number of personnel following adjustment of the service term might also affect the amount of personal equipment required.

[8] See, for example, Peter Jackson, *France and the Nazi Menace: Intelligence and Policy Making, 1933–1939* (Oxford, 2000), 210.

[9] Bruce Strang, *On the Fiery March: Mussolini Prepares for War* (Westport, 2003), 26–7, 342–3; John Gooch, *Mussolini and his Generals: The Armed Forces and Fascist Foreign Policy, 1922–1940* (Cambridge, 2007), 520.

[10] As already mentioned, Joseph Maiolo suggests the category 'air-land', in contrast to naval and air ('Armaments Competition', 293). The term has the advantage of brevity, but is perhaps too evocative of the US Army 'AirLand' doctrine of the 1980s. *See* the discussion of air roles in Richard J. Overy, *The Air War, 1939–1945* (London, 1980), 8–14.

[11] Much attention was also paid to anti-aircraft artillery in the 1930s, although its tactical dual role (as an anti-tank weapon) was not then so evident.

[12] The *Luftwaffe* after May 1940 came (erroneously) to be seen by historians as a force designed to co-operate with the German Army. That was not the intention of the pre-war air commanders of the Third Reich, nor the perception of foreigners in the late 1930s. See James Corum, *The Luftwaffe: Creating the Operational Air War, 1918–1940* (Lawrence KS, 1997), 255–6, and Jackson, *France*, 127–8, 268.

depending on the country involved). Nevertheless, the concept of total-war pre-parations was first put forward in relation to land armaments. And the main theorists of 'total' war (in the sense of production mobilization) were senior army officers, rather than naval or air-force officers.

A final complex feature of armaments competition in the 1930s was the number of different countries taking part. The land armaments competition before the First World War primarily involved four great powers. The land-armaments com-petition for much of the Cold War was between two close-knit alliances. In the inter-war years France, Germany, Italy, Japan, the Soviet Union, Britain, and the United States all had independent land-armaments programmes, and they pro-gressed at very different rates.[13]

This chapter has a perspective that is global rather than European. It also takes the story beyond September 1939, when an arms race was converted to open warfare involving—'only'—Germany, France, and Britain. Italy was also engaged in a peacetime army build-up until June 1940 (and probably entered the war when it did only because of the unexpected collapse of France). After September 1939 Germany and the neutral USSR (or at least the latter) were involved in a hectic arms race that lasted until June 1941, the period of the Non-Aggression Pact.[14] The neutral United States began fitfully to rebuild its army in 1940–1 to take part in a similar process, one which continued to December 1941. Japan and the USSR, neighbours at peace but intensely wary of one another, continued an arms competition at least through the autumn of 1941, and arguably up to August 1945.

Thus far I have been defining terms and setting parameters. The remainder of this chapter will consist of an outline of developments in the inter-war arms dynamic in the two decades before the Second World War, followed by a discus-sion of causal factors, and an evaluation of how these developments differed from other 'arms races'.

The Legacy of the First World War

How did the major armies develop in the inter-war decades? The land fighting in the two major conflicts of the early twentieth century, the Russo-Japanese War and the First World War, had been affected tactically by the firepower revolution of the later nineteenth century—including magazine-loaded rifles, machine guns, and

[13] For reasons of space China and the medium-sized European states, for example Poland, are not considered here. They were, however, a significant factor in land-armaments developments even in the 1930s. On China, see Chang Jui-Te, 'The Nationalist Army on the Eve of the War', in Mark R. Peattie and Edward J. Drea, eds., The *Battle for China: Essays on the Military History of the Sino-Japanese War of 1937–1945* (Stanford CA, 2011), 83–104. The Little Entente was certainly a factor in Soviet and German military planning in the late 1920s and early 1930s; see Piotr Stefan Wandycz, *France and her Eastern Allies 1919–1925: French-Czechoslovak-Polish Relations from the Paris Peace Conference to Locarno* (Minneapolis MN, 1962), and Piotr Stefan Wandycz, *The Twilight of French Eastern Alliances, 1926–1936: French-Czechoslovak-Polish Relations from Locarno to the Remilitarization of the Rhineland* (Princeton NJ, 1988).

[14] I would argue that the USSR, at least, saw itself as being involved in an arms race in 1939–41. In the German case what was going on—from about July 1940—was direct preparation for war.

quick-firing artillery. The First World War had been primarily a land conflict.[15] It had been affected at the operational and strategic levels by transportation problems, brought on by the unprecedented size of the armies, and—especially in 1914–18 on the Western Front—by the very high force-to-space ratios. The course of the land war had been shaped, too, by the situation at the strategic and diplomatic level: balanced alliances meant that neither set of armies had had a clear and continuous numerical advantage. Another particular feature of the First World War was that soldiers from the British Empire and the United States took part in large numbers on the European continent.

These characteristics emphasized the power of the defence, and trench warfare was a lasting memory of 1914–18, at least in Britain, France, and Germany, as static land fronts resulted in the death or maiming of millions of soldiers. The war of attrition, lasting fifty-two months, made the conflict a prolonged industrial one, to which the term 'total war' is often attached. It involved the mobilization of whole economies, primarily for the production of land armaments and army supplies. Imperial Russia was knocked out of the war in 1917 partly because of an inability to cope with the demands of this wartime mobilization. The arrival of American troops and supplies in the spring and summer of 1918 provided vital support to the Allies, and the Germans made some crucial strategic mistakes in that year, but the consensus of opinion was that the British and French eventually prevailed because they mobilized their economies more effectively than did the Central Powers.[16]

Technological land-war developments in the 1904–18 era were incremental rather than revolutionary. Even in the later years of the First World War, chemical weapons, close-support aviation, motor transport, even armoured vehicles, had limited effect—although they were now widely expected to have a great impact on future wars.

STABILITY IN THE 1920s

The position of land forces in the 1920s seemed much less strained than it had been during the war or even in the years before it. The situation was, however, highly unnatural. Germany and Russia, previously two of the three strongest land powers (Germany in Europe, Russia in both Europe and Asia), were largely removed from the strategic scene. The German Army was greatly reduced by the terms of the Versailles treaty. It was limited to 100,000 long-service troops, which prevented the accumulation of a large pool of trained (post-active-service) reservists; there was to be no conscription. Organizationally the army was limited to

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[15] The Russo-Japanese War, in contrast, had been a rather different conflict, with a balanced weighting of land and naval armaments. For the deep impact of the Asian war see Bruce W. Menning, 'Neither Mahan nor Moltke: Strategy in the War', in John Steinberg and Bruce Menning, eds., *The Russo-Japanese War in Global Perspective: World War Zero*, 1 (2 vols. Leiden, 2005), pp. 155–6.

[16] This sketch is greatly simplified. For an overview see Hew Strachan, *European Armies and the Conduct of War* (London, 1983), 130–49.

seven infantry divisions and three cavalry divisions, and it was forbidden heavy artillery, armoured vehicles, military aviation, and chemical weapons.[17] Although the Russian Army—now the Workers' and Peasants' Red Army—was recreated and greatly expanded in personnel terms in 1918–20, it was a 'de-modernized' civil-war force, and was soon demobilized after 1921. In 1926 the Red Army consisted of twenty-seven regular divisions and sixty 'territorial' ones.[18] The following year its troops numbered some 587,000, about 40 per cent of the size of the front-line tsarist army on the eve of the First World War.[19]

The armies of the British Empire and the United States disappeared as field forces capable of—or interested in—fighting in Europe.[20] Both countries also ended their wartime expedient of conscription. This strategic withdrawal was explained partly by geography and partly by tradition (including antipathy to a standing army). In the British case, especially, the huge and unprecedented casualties of the Western Front in 1914–18 made this an experience not to be repeated. The British Army also had extensive colonial commitments.

The main field army in continental Europe—and in the world—in the 1920s was that of France. Although French leaders feared another war with Germany, their army decreased in size, and neither an arms race nor even the 'maintenance of the military status quo' took place in the 1920s. At the end of the decade the French Army numbered about 200,000 troops, having been reduced from thirty-two to twenty divisions.[21] The expectation was that these could be raised to about three times that number—moving towards the ideal of the 'nation in arms'—after the outbreak of war, by breaking up the existing divisions and replenishing them with reservists. But the Army would hardly be ready for operations at the very beginning of another war.

In the early 1920s the French Army had been prepared for offensive action against weakened enemies (especially Germany); by the beginning of the 1930s—even before the start of Hitler's rearmament—its posture had become essentially defensive, with the army unable to take action against Germany or directly to support its clients in central Europe. At the very end of the 1920s, faced with an impending decline in the number of potential conscripts (a result of the 'hollow

[17] Size is relative. In 2013 the military personnel strength of the German Army and *Luftwaffe* together was also only about 100,000; there were five ground-force divisions.
[18] The regular (*kadrovye*) formations were near full strength; the territorial (*territorial'nye*) formations were composed of 'militiamen' with limited training; they had similarities to the US National Guard and the British Territorials.
[19] N. M. Kiriaev, et al, eds., *KPSS i stroitel'stvo Sovetskikh vooruzhennykh sil* (Moscow, 1968), 137; G. F. Krivosheev, ed., *Rossiia i SSSR v voinakh XX veka: Poteri vooruzhennykh sil: Statisticheskoe issledovanie* (Moscow, 2001), 91; Roger Reese, *Stalin's Reluctant Soldiers: A Social History of the Red Army, 1918–1941* (Lawrence KS, 1996), 62.
[20] On the British Army, see Brian Bond, *British Military Policy between the Two World Wars* (Oxford, 1980). On the US Army, see Russell Weigley, *History of the United States Army* (New York, 1967), and Edward M. Coffman, *The Regulars: The American Army, 1898–1941* (Cambridge MA, 2004).
[21] On the French Army, see Robert A. Doughty, *The Seeds of Disaster: The Development of French Army Doctrine, 1919–1939* (Hamden CN, 1985), and Eugenia C. Kiesling, *Arming against Hitler: France and the Limits of Military Planning* (Lawrence KS, 1996). On the Army in the 1930s, see Martin S. Alexander, *The Republic in Danger: General Maurice Gamelin and the Politics of French Defence, 1933–1940* (Cambridge, 1992).

years [*les années creuses*]', the period of low birth rate during the First World War), the French government turned to a system of fixed fortifications to screen part of their border and allow concentration of existing strength; this would become known as the Maginot Line.

The Italian Army had been reduced to 30 divisions and 550,000 men in 1919, and by the late 1920s, even after the fascists came to power (in 1922), the number of divisions had been reduced to twenty-one. In 1926 a planned wartime level of fifty-two divisions had to be brought down to thirty.[22] The Japanese Army was, with the weakening of the Russians, now the major army in Asia. Of the major-power armies only that of Japan had not had direct exposure to the 1914–18 fighting in Europe (although its involvement in the Russo-Japanese War of 1904–5 had been a very considerable undertaking). An attempt was made in Tokyo at the beginning of the 1920s to learn at second hand the 'lessons' of the First World War in Europe, in terms of equipment, troop organization, and—in theory at least— economic preparation.[23]

ATTEMPTS TO LIMIT LAND ARMAMENTS

Another relevant feature of the 1920s was widespread support for disarmament, or at least the avoidance of another arms race. The worst consequence of the 1914–18 war had been the huge and unprecedented number of soldiers killed and maimed in the land fighting. The total of dead and missing military personnel (the over-whelming majority from the armies) as a result of combat was 1,900,000 Russians, 1,800,000 Germans, 1,200,000 French, 900,000 Austro-Hungarian, 900,000 British, 450,000 Italian, and 50,000 American.[24] Although the victorious Allies assigned responsibility for this terrible war above all to the German Empire, the conviction developed at a very early date that more general factors, including competition in armaments (land and naval), had been important in both the outbreak of the war and in its unprecedented destructiveness.

The international community attempted to avoid a repetition of such competition.[25] Article 8 of the 1919 Covenant of the League of Nations declared that 'the maintenance of peace requires the reduction of national armaments to the lowest point consistent with national safety and the enforcement by common action of international obligations'; it envisaged plans to bring about that reduction,

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[22] On the Italian Army, see John Gooch, *Mussolini and his Generals* (Cambridge, 2007).

[23] On Japan, see Edward Drea, *Japan's Imperial Army: Its Rise and Fall, 1853–1945* (Lawrence KS, 2009, 146–62, 181–9, 197–200), and Mark R. Peattie, *Ishiwara Kanji and Japan's Confrontation with the West* (Princeton NJ, 1975).

[24] These figures are rounded to the nearest 50,000. The main point is the scale of the slaughter; combat losses in the last major European war, in 1870, had been less than 90,000. The demography of army combat losses in 1914–18 war is far too complex to discuss and document here, but the number wounded was generally at least twice the number killed, and non-combat deaths (mainly from disease) were a very major factor in some armies.

[25] The First and Second Hague conferences (1899, 1907) had attempted to limit armaments, but they were essentially concerned with reducing heavy expenditure.

including exchanging information about 'military [i.e. land-armament], naval, and air programmes'. In the introduction to Part V of the Treaty of Versailles Germany undertook a reduction of its armed forces '[i]n order to render possible the initiation of a general limitation of the armaments of all nations'.[26] There was also an agreement, the 1928 Kellogg-Briand Pact, in which the signatories—including all the major land powers—renounced war as an instrument of national policy.

It is notable, however, that no major international agreement was reached in the 1920s or early 1930s limiting land armaments. This was in contrast to the Washington (1922) and London (1930) naval treaties—and to the much-later 1990 'Treaty on Conventional Armed Forces in Europe' (CFE). Naval arms control was easier to put in place, monitor, and enforce. Warship competition of the 1920s and early 1930s was also between the victors of the First World War, who were engaged in building programmes which they themselves regarded as excessively expensive; also only five states were involved (neither the USSR nor Germany were major naval powers).[27]

Some general discussion about land-armaments limitations took place at the 1932–4 Geneva disarmament conference.[28] The Japanese Army (and government) was hostile to the whole disarmament process, and the USSR was not involved. The government in Berlin complained, with justification, that only Germany had disarmed. There was a failure to obtain German–French agreement on even a gradual movement toward equal status for Germany in armaments (at a lower level). By the summer of 1932 the German government had lost interest in the disarmament process. January 1933 brought to power a political party which desired a fully rearmed Germany, but even the Nazis might have continued negotiations on gradual moves toward equality of armaments (as Germany would become stronger and France weaker). In the end Hitler pulled Germany out of the Geneva Conference—and the League of Nations—in October 1933. This was followed by the breakdown of the conference, which adjourned in November 1934 and did not re-convene.

BREAKOUT IN THE EARLY 1930s: THE SOVIET UNION AND GERMANY

With hindsight it is clear that the general situation with respect to land armaments began to change with developments in Russia and Germany. In both cases the process involved returning to the pre-1914 strength relative to the other major powers. In the Soviet Union, where a key factor was economic recovery (from

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[26] Treaty of Versailles: http://avalon.law.yale.edu/imt/partv.asp. One remarkable medium for 'exchanging information' was the *Armaments Year-Book*, published by the League of Nations in Geneva from 1926 to 1940.

[27] On naval arms limitation treaties see the chapter by Joseph Maiolo in this volume.

[28] On the 1932–34 Geneva conference, see Caroline Kitching, *Britain and the Problem of International Disarmament, 1919–34* (London, 1999), 140–73, and Dick Richardson, 'The Geneva Disarmament Conference, 1932–34', in Dick Richardson and Glyn Stone, eds., *Decisions and Diplomacy: Essays in Twentieth-Century International History* (London, 1995), 60–82.

war, revolution, and civil war), and where there were no treaty limits, the beginning of a programme of rearmament and war-industrial planning is often dated from 1927. In the next few years the process was bound together with the consolidation of Stalin's power and the extraordinary developments of the first Five Year Plan (1928–32). By the end of the Plan period both the personnel and equipment of the army had begun to expand, and a strong interest was shown in the development of artillery, armoured forces and air power (the air force being an integral part of the Red Army). Crucially, a general industrial base for further development had been established.[29]

The Nazi takeover in Germany in January 1933 marked a more obviously decisive turning point in the arms dynamic, although it can also be seen as an acceleration of earlier movement. Some illicit development of armaments banned by Versailles (tanks, military aircraft, chemical weapons) had been carried out—partly on Russian territory—in the 1920s. In 1928 the 'Weimar' German government had developed secret plans to increase the size of the army considerably beyond the existing limits.[30] Although immediately on taking power Hitler assured the leaders of the army that rearmament and a return to great-power status were central to his government's policies, the existing military weakness of the country—relative to its neighbours—meant that the project had to be pursued cautiously over the next two years.

In May 1935, however, Hitler openly declared Germany's military sovereignty. Germany would have a peacetime army of thirty-six divisions, based on one-year conscription (beginning in October 1936). Military sovereignty, unilaterally announced, meant renunciation of the international technical limitations that had been imposed (for example forbidding armoured vehicles and heavy artillery). And in reality the Germans, like the Russians, would certainly embrace modernization of their equipment and doctrine.[31] Germany also admitted the existence of an air force, and one organized as an independent service. The aim of the regime was not just to return Germany to equal status with the other major powers (undoing the Treaty of Versailles) but also to achieve military superiority. As Hitler put it in his secret August 1936 'Four Year Plan' Memorandum: 'Military development is to be effected through the new army. The extent and pace of the military development of our resources cannot be made too large or too rapid!' Rearmament was critically important: 'If we do not succeed in developing the German *Wehrmacht* within the shortest possible time into the first army of the world, in training, in the raising of units, in armaments, and, above all, in spiritual education as well, Germany will be lost!'[32]

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[29] On Soviet developments, see L. Samuelson, *Plans for Stalin's War Machine: Tukhachevskii and Military-Economic Planning, 1925–1941* (Basingstoke, 2000), and David R. Stone, *Hammer and Rifle: The Militarization of the Soviet Union, 1926–1933* (Lawrence KS, 2000).

[30] On German developments, see Wilhem Deist et al., eds., *Germany and the Second World War* I, 10 Vols. (Oxford, 1990), pp. 373–540, and Wilhem Deist, The *Wehrmacht and German Rearmament* (London, 1981).

[31] On mobile warfare, see Mary R. Habeck, *Storm of Steel: The Development of Armor Doctrine in Germany and the Soviet Union, 1919–1939* (Ithaca NY, 2003).

[32] Four Year Plan memorandum, August 1936: http://germanhistorydocs.ghi-dc.org/pdf/eng/English61.pdf.

Armies from countries of the 1914–18 Allies—France, Italy, and Japan—countries that, unlike Russia and Germany, had not been limited in the 1920s by wartime defeat—developed less dramatically at the beginning of the 1930s. In the background were budget constraints stemming from the Depression. The first half of the 1930s also marked the low point of French expenditure on land armaments. It is interesting that *Merchants of Death*, the classic exposé of the international arms trade published originally in the United States in 1934, incorrectly identified France as the major villain: 'Perhaps the most important and largest arms manufacturing country today is France.' The book made no reference whatever to the USSR as an arms producer.[33]

The Japanese Army, or at least the parts of it based in north-east China, meanwhile resorted to force, taking control of Manchuria in 1931–2. This was an event of extraordinary importance in inter-war international relations, but the army itself did not change in major ways. The Italian Army was still relatively weak in the early 1930s, unable even to face a border war with Yugoslavia. The army estimated that it would mobilize only 34 divisions for such a conflict.[34]

THE ARMS RACE OF THE LATE 1930s

If the *early* 1930s can be characterized—in theoretical terms—as a time of limited 'arms competition' the *later* 1930s—especially 1936–9—can be seen as the stage of 'arms racing'. The Germans rapidly expanded their army (and created the air force they had been forbidden at Versailles). The re-militarization of the Rhineland in March 1936 was also important, as it provided a military screen behind which an even more rapid expansion could be implemented. Three secret expansion programmes were developed between December 1933 and August 1936. The first envisaged a peacetime army of 300,000 men and the third one of 830,000 men in forty-three divisions (by 1 October 1939); the third plan also envisaged a *wartime* army of 4,620,000 men in 102 divisions (also by 1 October 1939).[35] The emphasis was on ready forces capable of offensive operations. Despite their late start, the Germans developed an early healthy lead, facilitated by the large population of the Reich relative to its immediate neighbours.

The French response was neither as immediate nor as extensive as might have been expected. This was because of a preoccupation in the early 1930s with internal French economic problems as well as an existing lead over the Germans. The French in 1936 did, however, shift over to a two-year service term, considerably increasing the size of their army, but this was partly due to the decline in eligible conscripts. Britain did not make comparable changes to its army until after the Munich Crisis of late 1938, reintroducing conscription and planning for a 32-division 'European' army.[36]

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[33] H. C. Engelbrecht and Fank C. Hanighen, *Merchants of Death: A Study of the International Armament Industry* (London, 1934), 237–59.

[34] Gooch, *Mussolini*, 209.   [35] Deist, *Germany* I, 446.

[36] David French, *Raising Churchill's Army: The British Army and the War against Germany, 1919–1945* (Oxford, 2000), 157–8.

Although the Red Army was very badly affected by the murderous purge of commanders and commissars in 1937–8,[37] it was also expanded rapidly, with major deployments in the West and in the Soviet Far East. The mixed regular-territorial system was wound down from 1935 and ended by 1939. The personnel of the armed forces increased from 1,100,000 in 1936 to over 2,000,000 in August 1939. The number of 'rifle' (infantry) divisions increased from 100 (77 regular and 23 territorial) at the end of 1935, to 168 at the start of 1940.[38] Soviet production of military equipment outpaced that of all the other powers, including Germany. In 1937 Soviet factories produced 1,600 tanks, 5,400 artillery pieces, and 4,400 military aircraft; in 1939 the annual production figures had at least doubled for each of these categories.[39]

The Italian Army did not enjoy anything like the dramatic trajectory of its German counterpart, partly because it started out at a higher numerical strength, partly because smaller funds were dedicated to its re-equipment, and partly because conflicts in Abyssinia and Spain diverted its efforts. In November 1939 of ninety-three divisions that existed on paper only ten were fully equipped, and twenty-nine more had only minor equipment shortages; thirty-two of the remainder were incomplete and twenty-two divisions had yet to be constituted.[40]

The mid-1930s were also a time when economic preparation for 'total war'—mainly total *land* war—became part of the race. This was especially the case in Germany and the USSR. The first two Soviet Five Year Plans (1928–32 and 1933–7), were concerned with development of general productive capacity in state enterprises, although in the unfinished third Five Year Plan (1938–42) the stress was on actual production of armaments (mostly land armaments). The Five Year Plans did provide a model for the future Axis powers. This was especially true in Germany, where the Four Year Plan announced in September 1936 was aimed at the state-supervised creation of military self-sufficiency; much thought and effort were also devoted in Japan in the 1930s to military-related economic development.

As already mentioned, the development of armies in the late 1930s was affected by involvement in regional wars. These drained off resources from preparation 'in depth' for a major-power, high-technology, total war. The most extreme case was the commitment of much of the Japanese Army to war in China. The conflict, which began in July 1937 and which was originally intended in Tokyo to involve only a few divisions for a short period in north China, eventually led to the raising of twenty new divisions. These forces, moreover, were fighting a primitive infantry campaign in China, when the top-level Japanese Army planners wanted to prepare

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[37] The Red Army purge, although drastic in its consequences, was part of a much larger national political event and had little to do with technical military matters. In particular, it had only a limited effect on the overall size of the Red Army or on land-force procurement, although it certainly affected the Army's war-fighting potential.

[38] Roger Reese, *The Soviet Military Experience: A History of the Soviet Army, 1917–1991* (London, 2000), 65; D. M. Glantz, *Stumbling Colossus: The Red Army on the Eve of World War* (Lawrence KS, 1998), 152.

[39] *Velikaia Otechestvennaia voina, 1941–1945: Voenno-istoricheskie ocherki* 1 (4 vols., Moscow, 1998), p. 508.

[40] Gooch, *Mussolini*, 494. The divisions were mostly lightly-equipped *binaria* (two-regiment) ones.

for a mechanized war with the Red Army in Siberia.[41] Italy, meanwhile, devoted very considerable army resources to the invasion and occupation of Abyssinia in 1935–6. The USSR, Germany, and especially Italy all sent ground forces or army advisors to Spain during the civil war of 1936–9. The Red Army was especially involved in such conflicts, with advisors and equipment sent to Spain and China, medium-sized border conflicts with Japan in 1938 and 1939, an invasion of eastern Poland in 1939, and a very costly war fought in Finland in the winter of 1939–40. The British were not involved in open conflict of this sort, but their army was configured until 1938 for colonial policing, as during the 1936–9 Arab Revolt in Palestine, rather than continental war.

The outbreak of full-scale (land) war between Japan and China in 1937 and the start of the European war in September 1939 did not mark the complete end of the peacetime dynamic of land armaments. It is relevant to consider the situation of non-combatant states over the two years between September 1939 and December 1941. While local fighting was continuing in China, and a European war beginning in Poland, and then in the Low Countries and France, the great-power neutrals in the European war were increasing the size of their armies, to some extent in the context of an arms race.

Italy did not enter the European war for nine months, until June 1940; Mussolini had told Hitler in August 1939 that his country was unready. For nearly two years, up to June 1941, the USSR strove to avoid involvement in the European War, at least until the strategic situation was more favourable.[42] Moscow did attempt to avoid an attack by developing the Red Army as a deterrent. Military service was increased from two to three years in 1940. By July 1940 the Red Army had reached 4,000,000, and by June 1941 was over 5,000,000. The number of Soviet infantry divisions increased from 168 in January 1940 to 179 in January 1941 and to 198 at the time of the German invasion (when there were a further ninety-five tank, mechanized, and cavalry divisions).[43]

The land armaments of the United States were still negligible in size; on the eve of the European war there were 190,000 in the regular army, and about 200,000 in the National Guard; these troops were distant from any likely battlefield, with the exception of those stationed in the Philippines. In 1940 the US introduced conscription, and in the course of the following year—grossly exaggerated—plans were worked out to expand the US Army to 213 divisions.[44]

PRESSURES: TECHNOLOGICAL DEVELOPMENT

Three factors are conventionally thought of as drivers of the 'arms dynamic': technological developments, the activities of other countries, and internal

[41] Michael A. Barnhart, *Japan Prepares for Total War: The Search for Economic Security, 1919–1941* (Ithaca NY, 1987), 90.
[42] On this period, see especially Gabriel Gorodetsky, *The Grand Delusion: Stalin and the German Invasion of Russia* (New Haven CT, 1999).
[43] Reese, *Experience*, 95; Glantz, *Colossus*, 9, 11, 269; Krivosheev, *Rossiia i SSSR*, 220, 222.
[44] Weigley, *History*, 419, 437–8.

structures.[45] Which of these influences constituted the most important 'pressures' on states to develop their armies in the inter-war years, and especially in the 1930s?

Technological developments can certainly act as a pressure; the appearance of new weapons elsewhere requires their incorporation in the national arsenal. This could apply to a specific weapon system or to broader changes (widespread use of motor transport, for example). Land warfare in the Second World War in most theatres would be technologically quite different from land warfare in 1914–18. Nevertheless, in the 1920s and 1930s—indeed, before May 1940—neither generals nor political leaders can be said to have possessed an accurate vision of the future. Armies were expanded in the 1930s, but this expansion was not mainly driven by technology.[46]

The situation with regard to naval armaments and air armaments was different. Naval expansion was partly driven by significant developments in firepower and protection (armour).[47] Aviation provided a whole category of armaments that was quite new, as well as being uniquely threatening to cities and civilians. Nevertheless there was also an exaggerated expectation of what the bombers of the Guernica era could achieve.

Competition in land armaments in the 1920s and 1930s was in essence more about the numbers of divisions than the level of equipment, although there was an interest across the board in 'motorization' (provision of motorized road transport) and also in 'mechanization' (tanks, mobile artillery, etc., with a cross-country capability). Tanks and mobile heavy artillery were seen in the international/disarmament community as a particular threat, but there were few new types of ground-force weapons in the 1930s.[48]

Those states which did develop their army equipment technically did not, in general, do so in response to potential enemies, nor did they excessively alarm their neighbours. The Russian tank and artillery programme of the early 1930s was not a case of 'catching up': it was driven largely by an intellectual construct developed in the Red Army command, and one that had the advantage of drawing on a doctrinal blank slate. Modernization of the Red Army was also related to a national (civilian and military) project of motorization in the Five Year Plans. There is also

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[45] Barry Buzan, *Introduction to Strategic Studies: Military Technology and International Relations* (New York, 1987), 76–113; and Barry Buzan and Eric Herring, *The Arms Dynamic in World Politics* (London, 1998), 79–81.

[46] On military technology and related doctrine in the 1930s, see articles by D. E. Showalter, 'Military Innovation and the Whig Interpretation of History', in Harold R. Winton and David R. Mets, eds., *The Challenge of Change: Military Institutions and New Realities, 1918–1941* (Lincoln NE, 2000), 220–36; Dennis E. Showalter, 'Plans, Weapons, Doctrines: The Strategic Cultures of Interwar Europe', in Roger Chickering and Stig Förster, eds., *The Shadows of Total War: Europe, East Asia, and the United States, 1919–1939* (Cambridge, 2003), 55–81; Hew Strachan, *European Armies*, 50–168; and Williamson Murray and Alan R Millett, eds., *Military Innovation in the Interwar Period* (Cambridge, 1996).

[47] Nevertheless, the consensus of the naval professionals was that the big-gun battleship remained the standard weapon system, as it had been in 1914–18.

[48] At the Geneva disarmament conference in the early 1930s, certain land weapons were considered by some states to be 'of a peculiarly aggressive value against land defences', for example tanks over 16–20 tons and mobile artillery over 155mm; see 'Preliminary Report on the Work of the [Geneva Disarmament] Conference', 58–69: http://digital.library.northwestern.edu/league/le00089b.pdf.

little evidence that the development of Soviet tank forces caused alarm among the major European powers; it did have a resonance in Japan, but that country's pre-occupation from 1937 onwards with China meant the Japanese Army could not respond to the Soviets in kind. The German Army's development of tank forces, including creation of the first three *Panzer* divisions in 1936, also did not cause a great deal of alarm in London or Paris (although it should have). There was no race in the 1930s to match the number or capability of foreign vehicles. This was in contrast to the wartime situation in 1942–4, and to the NATO/WTO central-front 'tank gap' of the 1950s.

The French Army in the 1930s at least matched the Germans, quantitatively and qualitatively, in tank and artillery production. The French assumption was also that ground war would be prolonged, and that defences—fixed and mobile—would successfully resist any attack.[49]

The provision of ground-support aircraft would turn out to be an important element of 'land'—combined-arms—warfare from 1939 onwards, but there was only a limited attempt to develop specialized battlefield aircraft. There were many reconnaissance planes, and light and medium (single- and twin-engined) bombers with a dual operational/strategic role.

Technology was a larger factor in the final period of arms competition, after May 1940. This was after the lightning battles in the Low Countries and France had revealed the potential of tanks, strike aircraft, and large armoured formations. The Soviets reorganized their armoured forces, expanded them, and began to deploy exceptionally powerful new tanks and armoured battlefield aircraft. Between September 1939 and June 1941 the neutral USSR increased its infantry strength from ninety-six divisions to 198; in 1940 it established nine division-sized armoured units ('mechanized corps'), and in March 1941 began creation of twenty more.[50] The American military also anticipated the formation of fifty or sixty armoured divisions,[51] although this probably had less of a *deterrent* intent than the Soviet effort.

PRESSURES: ACTION-REACTION

The second pressure explaining the changes of armaments in a given country was that of external events, especially the actions of foreign states; this is sometimes termed the 'action-reaction model'. This model might usefully be taken to have two versions. The first involves changes in the level of armed force of a country brought about by changes in the armed forces of other countries. This, if the

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[49] See Doughty, *Seeds*, 136–77 and Jackson, *France*, 171. For the relative quality of French and German equipment see Karl-Heinz Frieser, *The Blitzkrieg Legend: The Campaign in the West, 1940* (Annapolis MA, 2005), 36–44.

[50] *Istoriia vtoroi mirovoi voiny 1939–1945*, 3 (12 vols., Moscow, 1974), pp. 418–20. On modern-ization see especially Stalin's 5 May 1941 Kremlin speech, printed in Jürgen Förster and Evan Mawdsley, 'Hitler and Stalin in Perspective: Secret Speeches on the Eve of Barbarossa', *War in History* 11/1 (2004), 88–102.

[51] Weigley, *History*, 467.

'changes' involve an *increase* of armaments, is a classic arms race or arms 'competition'. (Indeed the notion of an 'arms race' or an 'arms competition', by definition, *requires* use of the 'action-reaction model'.[52]) The second version of the 'action-reaction model' would consider changes in the level of the armed forces of a country, as a result of a growing *more general* (political) external threat. This would be the case if a neighbouring state became more overtly hostile, or made strategic gains that put it in a more advantageous military position.

In the case of inter-war land armaments an example of the first version would be the French, Russian, and British reaction to the expansion of the German Army in the late 1930s. And to take in the second version, this would not just be the enlargement of the German military, but also the appearance of a radically nationalist revisionist regime in Berlin, or the improvement of the German strategic position by the militarization of the Rhineland in 1936, or the annexation of Austria and the Czech lands.

I would argue that the action-reaction model cannot readily be applied to changes in the Soviet and German armies in the early 1930s. The USSR and Germany, two of the three most important land-armaments states, were actually *re*-arming after earlier events had led to an artificial reduction of their armies. Neither the initial Soviet land-armaments build-up nor the initial German one could be seen as a response to a *new* threat, including a land-armaments expansion programme by potential enemies.

The real threat to Soviet Russia in the later 1920s was less than it had been at the end of the First World War. The armies of the major—victorious—powers were actually *reduced*, and the German Army was incapable of offensive action.[53] There was a Soviet 'war scare' in 1927, but that had more to do with internal politics, diplomatic perceptions, and isolated events than with the actual arms build-up of rivals, including the Japanese.[54] The later occupation of Manchuria, in 1931–2, did raise the level of threat to the USSR by improving the position of Japanese forces, but there was no immediate expansion of those forces.

The development of Soviet heavy industry and the deployment of modernized forces in the Far East might be seen—as mentioned above—to have provoked a reaction, but in the end Japan was unable to respond in kind due to other

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[52] To use the definition of Buzan and Herring, 'arms racing is an abnormally intense condition in relations between states reflecting either or both active political rivalry and mutual fear of the other's military potential', in *Arms Dynamic*, 78.

[53] It might be argued, however, that the initial drive to rearmament was partly justified by the strength of minor powers armed by the French, notably Poland and the 'Little Entente'. In the case of the Germans this meant the Czechs and the Poles, in the case of the Russians it meant the Poles and the Romanians. See James S. Corum, *The Roots of Blitzkrieg: Hans von Seeckt and German Military Reform* (Lawrence KS, 1992), and Samuelson, *Plans*, 71–4.

[54] A range of issues were bundled together as a cause of the 1927 Soviet war scare, including a police raid on the Soviet trade delegation (ARCOS) in London in May 1927, and the assassination of the Soviet Ambassador to Warsaw the following month. Also important was the establishment of the Piłsudski government in Warsaw in 1926 and Chiang Kai-shek's campaign against the Communists in China. On the military-economic impact of the war scare see especially Stone, *Hammer and Rifle*, 43–6, and Nikolia Simonov, 'The "War Scare" of 1927 and the Birth of the Defence-Industry Complex', in John Barber and Mark Harrison, eds., *The Soviet Defence Industry Complex from Stalin to Khrushchev* (Basingstoke, 1999), 33–46.

developments—war in China and growing naval tension with the United States (and resultant naval expenditure).

German developments—for the army or other armed services—were also not the result of any simple 'action-reaction cycle'. They were essentially a 'break-out' from the Versailles disarmament conditions. The French Army had not been increased, and its posture in the early 1930s was increasingly defensive; British land armaments were certainly not a threat to the Third Reich. The USSR was physically remote from Germany (until 1939), and the two countries did not share a common military border until late 1939. The German move from the initial declaration of military sovereignty to a position where the German Army was further expanded and prepared for military superiority in 1935–6 was also not a reaction to developments in enemy armies.

The German breakout, obviously, eventually provoked a reaction in France and, very late in the day, in Britain. If any event can be described as an 'arms race' in Europe this was probably it. However, the French 'reaction' was quite slow, with the introduction of two-year service coming only in 1936. It was even slower in Britain, where serious consideration of expanding the divisional strength of the army began only after the German annexation of the Czech lands in March 1939. The British and French still hoped that they could prevail through wartime mobilization rather than by preparing ready-to-go mass armies before the war began. Britain did, however, need to provide a concrete military guarantee to the French, especially after the loss of the Czechoslovak Army as a potential ally in early 1939.

An action-reaction arms race of a sorts did also develop between Japan and the Soviet Union in the 1930s, although tense relations between the two countries involved more than just this.[55] There was the memory of the 1904–5 war, the ideological threat of communism, the Japanese occupation of eastern Siberia in 1918–22, and rival ambitions in North East Asia—especially in Manchuria. The Japanese Army took a strong interest in developments in Russia in the first two Soviet Five Year Plans, which were both increasing Moscow's 'in depth' preparation for industrial war and specifically increasing the number and quality of Red Army divisions available to fight in the Far East. The end of the 1930s witnessed a progressive build-up—arms race—of the two armies in the Manchurian area. In 1937 the peacetime balance was estimated by Japanese intelligence to be twenty Soviet divisions versus six Japanese ones; in 1938 the balance was twenty-four to eight, by 1939 thirty to nine, and 1940 thirty to twelve. Even in 1941, when the Soviets had to reinforce their European border, the balance was twenty-three to fourteen.[56] After the *Wehrmacht* invasion on 22 June the Japanese Army did significantly reinforce its forces in Manchuria, but Soviet forces were sufficient to deter further action.[57]

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[55] Alvin D. Coox, *Nomonhan: Japan against Russia, 1939* (2 vols., Stanford, 1985), i, pp. 74–91.

[56] *Japanese Studies in Manchuria*, vol. 13, 25, 45. This was based on the work of Hayashi Saburō, who had headed the Russian section of the General Staff Intelligence bureau. Hayashi also wrote, with Alvin D. Coox, *Kōgun: The Japanese Army in the Pacific War* (Westport CN, 1971).

[57] *Imperial Army*, 216–21; Coox, *Nomonhan*, 2, 1035–60. Coox concluded that the Japanese Army in Manchuria in late 1941 still did not have sufficient offensive capacity (or even readiness status); it was still markedly inferior to the local Red Army in firepower, mobility, armour, and air support (pp. 1052–3).

The Soviet build-up of land armaments in the late 1930s, unlike that at the beginning of the decade, was in part a reaction to Hitler's open rearmament (from 1935). However what was happening was also a logical conclusion to the development of Soviet arms-industry capacity, and a further round of armament expansion would probably have happened with or without the German dash at the end of the decade.

The beginning of the American land armaments expansion was also a reaction of sorts, but to the events in the Low Countries and France in the summer of 1940, which demonstrated the effectiveness of the German Army. Before September 1939 the US Army had indeed hoped that Washington would react in some way to the European arms race. A War Plans Division study from late 1938, arguing for the development of a balanced 'national defense system', noted that Germany could muster ninety divisions, Italy forty-five, and Japan fifty (in China), but the United States did not have a single combat-ready division.[58] This is not to say that the United States was not involved in arms competition, but it was in the realm of air and naval weapons.

PRESSURES: DOMESTIC STRUCTURES

The third and final pressure on the dynamics of land armament was brought about by domestic structures rather than by technology or by an action-reaction cycle. 'Domestic structures'—which might be thought of more generally as *internal* factors—comprise a range of elements, some more obvious than others.

Was the arms industry itself a cause of the military build up, in land armaments as well as those of navies and air forces? Article 8 of the 1919 League of Nations Covenant noted that 'manufacture by private enterprise of munitions and implements of war is open to grave objections'. Anti-war polemics in the 1920s and 1930s certainly had targeted the 'merchants of death': firms such as like Krupps, Vickers, or Schneider/Creusot. Some thirty years later, in 1961, President Eisenhower made his famous warning about the 'military-industrial complex': 'Until the latest of our world conflicts [1941–5], the United States had no armaments industry. American makers of ploughshares could, with time and as required, make swords as well. But now we […] have been compelled to create a permanent armaments industry of vast proportions.' Americans had to guard against the 'unwarranted influence' of this industry.[59] But is hard to see the arms race before 1939/1941 resulting from the pressures of private business, even among the rapidly arming European 'aggressor' powers.

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[58] Weigley, *History*, 418.

[59] Cited in Richard Hofstadter, ed., *Great Issues in American History: From Reconstruction to the Present Day, 1864–1969* (New York, 1969), 450–1. This statement actually reflected the President's US Army background; there had certainly been a major American arms industry building warships before 1941.

An often-neglected feature of 'domestic structures' was inter-service rivalry.[60] In all the major countries, and especially in Germany and Japan, different branches of the armed forces were bidding against one another. There had always been a rivalry for funding between armies and navies. In nearly all countries aviation had now emerged as a new and greedy claimant on state funds—especially equipment funds, in some cases with the bureaucratic advantage of being a separate branch of service, as in Britain, Germany, Italy, and France. In 1935 the decision to expand the peacetime German Army beyond thirty-six divisions was partly driven—on the army side—by a desire not to fall behind the navy and the *Luftwaffe* in placing orders.[61] Similar problems occurred in the arms build-up in Japan, and they were certainly not unknown in the other major countries. The Axis countries seem to have had particular difficulties in bringing about a rational cross-service programme of military expansion.

Powerful traditional military elites were in place in the 1920s and 1930s, predisposed to support a foreign policy based on a high level of armaments; this was not just the preserve of civilian ideologists of the extreme left or right.[62] The extreme case was perhaps Japan, where the army had considerable autonomous power outside the Cabinet (although the Imperial Navy exerted a countervailing pressure). The military elites in Germany and Italy were also in favour of both the use of force as a means of carrying out foreign policy, and the maximum development of *armies*. The generals in Germany and Italy endorsed the revisionist foreign policies of the Nazi and fascist civilian governments, even though there might be some fundamental conflicts between an aristocratic army leadership and the more populist governments in Berlin and Rome. These army leaders tended to exaggerate external threats. The military elite in the USSR in the 1920s and 1930s was in some respects the least traditional among the major powers, but it was functionally not that different from its counterparts elsewhere.[63]

PRESSURES: IDEOLOGY

Military elites had also been an important structural component of arms competition before 1914 and in the Cold War, but what was different in the pre-1939/1941 period was that they were now joined by the leaders of extreme political movements. These movements glorified war or at least adopted an extreme view of geopolitics,

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[60] Surprisingly, inter-service rivalry is not discussed as a domestic structural factor in Buzan and Herring.

[61] Deist, *Germany* I, 429.

[62] The responsibility of the military experts of the high command for the excessive development and aggressive posture of the German Army is a major theme of Deist, *Wehrmacht*.

[63] The question of the Soviet military elite as an 'interest group' (as opposed to an instrument of the 'totalitarian' system) was a feature of 'Kremlinological' debates of the Cold War years; *see* R. Kolkowicz, 'The Military', in Harold Gordon Skilling and Franklyn Griffiths, eds., *Interest Groups in Soviet Politics* (Princeton, 1971), 131–69. But even in the 1920s and 1930s many of the leaders of the Red Army had served as junior officers in the tsarist army and arguably had internalized particular values.

based to some extent on racial concepts and social Darwinism. Richard Bessel has argued that the core of Hitler's movement was 'racial war':

> Nazism was inseparable from war […] As a political ideology, Nazism revolved around war and struggle: to fight was at once the main purpose of a nation and the measure of the health of a 'race'. The ideology of Nazism was an ideology of war, which regarded peace merely as preparation for war […] The Nazi leadership sought to militarize the German economy and society, and to indoctrinate the German population into the willing acceptance and even enthusiastic approval for war.

Hitler might have been wary of involvement in a general conflict (i.e. involving Britain and France) in September 1939. He certainly wanted, however, actual *war* against Poland (as he had wanted actual war against Czechoslovakia in 1938), and not just the achievement of territorial objectives by bluff.

All other policies were subordinated to future war-making. As Bessel put it, 'For Hitler, the economy was not primarily an arena for generating wealth but one for providing the hardware required for military conquest, and the determination to rearm underlay all the regime's economic policies'.[64]

Macgregor Knox related this to the revolutionary nature of both the German and Italian regimes:

> [T]he relationship between foreign and domestic policy in the two regimes was similar. Foreign policy was internal policy and vice versa; internal consolidation was a precondition for foreign conquest, and foreign conquest was the decisive prerequisite for revolution at home that would sweep away inherited institutions and values…

The 'prestige' of victory was needed to complete internal transformation.[65]

To some audiences Hitler attempted to cloak his ideological imperative in the guise of a reaction to external action—or at least *potential* external action. The Four Year Plan memorandum of August 1936 included a warning: 'The means of military power available to [the] aggressive will [of Russian Marxism] are […] increasing rapidly from year to year. One has only to compare the Red Army as it actually exists today with the assumptions of military men 10 or 15 years ago to realize the menacing extent of this development.' In the meeting with *Wehrmacht* leaders on 10 November 1937 (recorded in the Hossbach protocol) Hitler noted that by the period 1943–5 *Wehrmacht* re-equipment would be complete, and after that the position would become more dangerous for the Reich: 'Our relative strength would decrease in relation to the rearmament which would by then have been carried out by the rest of the world.'[66]

But for Hitler, in his heart of hearts, armies—and arms races—were only a means to an end, and in this the *Führer*'s motivation was to a degree different from

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[64] Richard Bessel, *Nazism and War* (London, 2004), 1, 46.

[65] Macgregor Knox, *Common Destiny: Dictatorship, Foreign Policy, and War in Fascist Italy and Nazi Germany* (Cambridge, 2000), 100, 109.

[66] Four Year Plan Memorandum, August 1936: http://germanhistorydocs.ghi-dc.org/pdf/eng/English61.pdf. Hitler was speaking about the Red Army threat to *Europe as a whole* (not specifically to Germany), and he projected the threat ten to twenty years into the future. Hossbach Memorandum: http://germanhistorydocs.ghi-dc.org/docpage.cfm?docpage_id=2321.

that of his military elite. As Williamson Murray has suggested, Hitler was not interested in building up a great army: he was interesting in going to war and in achieving political and territorial goals.[67]

The Italian case is perhaps less clear, due to the lack of both a strong national revisionist cause and effective military institutions. However, Mussolini arguably also wanted war for its own sake, as well as to create an Italian Empire.[68] For the Japanese, the situation was rather different, as there was no totalitarian leader-cult or movement. There were, however, individuals who advocated war as an end in itself, and as a means of national revolution or spiritual revitalization. Strong extra-parliamentary pressures existed, sometimes taking the form of the assassination of perceived civilian and military moderates. The army (and navy) had a great deal of independent power, and even among 'mainstream' Japanese political leaders there was an exaggerated sense of a Japanese national mission; this included—as in Germany and Italy—an intensely held advocacy of a 'new order' in a geopolitical sense.[69]

While discussing ideology as a pressure on the arms race, we must also consider Stalin's USSR. Murray has argued that the 'non-status quo nations' numbered four and not three. He included the Soviet Union as also having a government dedicated, like that of Germany, Italy, and Japan, 'to an aggressive foreign policy that assumed a high risk of war'.[70] Was arms-race ideology also a major factor in this fourth, Soviet, case? The USSR was certainly a state in which ideology played a central role. National defence was also related to the forced-draft industrialization which became Stalin's cause from the late 1920s, in the era of the Five Year Plans. From the mid-1930s the Communist Party directed a high proportion of resources to rearmament.

I would suggest, however, that although the USSR regarded itself as the vanguard of international socialism and was inherently hostile to the capitalist states (including the democracies), it was geopolitically a 'status quo' nation. The leaders in the Kremlin perhaps assumed 'a high risk of war' (to use Murray's words). Unlike the leaders of Germany, Italy, and Japan, however, the fear was that the USSR would be the *object* of aggression. National security was also the basis on which the Soviet Communist Party could legitimize itself its rule in Russia.[71] So ideology was a 'domestic structure', an internal pressure that led to massive rearmament in the

[67] Williamson Murray, *The Change in the European Balance of Power, 1938–1939: The Path to Ruin* (Princeton, 1984), 48–9.

[68] Bruce Strang, *On the Fiery March: Mussolini Prepares for War* (Westport, 2003), 28–9. Strang argues that the stress for Mussolini was on a social Darwinist drive for territorial expansion into the *spazio vitale*. Mussolini, however, was irrational in his concept of the means that could be used to achieve that goal; he did not see that a 'modern, well-equipped, highly trained military' was required, and he stressed 'demographic power' over industrial power (pp. 26–7, 342–3).

[69] Richard Storry, *The Double Patriots: A Study of Japanese Nationalism* (London, 1957); Akira Iriye, *The Origins of the Second World War in Asia and the Pacific* (Harlow, 1987); James B. Crowley, *Japan's Quest for Autonomy: National Security and Foreign Policy, 1930–1939* (Princeton NJ, 1966).

[70] Williamson Murray and Alan R. Millett, *Calculations: Net Assessment and the Coming of World War II* (New York, 1992), 6.

[71] On Communism and nationalism, see David Brandenburger, *National Bolshevism: Stalinist Mass Culture and the Formation of Modern Russian National Identity*, 1931–1956 (Cambridge MA, 2002).

USSR, but one that was peculiarly linked to a fearful perception of the outside world. MacGregor Knox seems nearer the truth than Murray with respect to the USSR. His argument is that the fascist regimes, at least in Germany and Italy, needed aggressive, expansionist war to complete their revolutions. In contrast, the Russian communists ('like Mao and Pol Pot') had already seized power in civil war and did not need territorial aggrandizement: 'in practice foreign conquest was a bonus, not an indispensable prerequisite for internal transformation'.[72]

Ideology was not a 'domestic structure'—either offensively or defensively—for the democracies, France, Britain, and the United States. They were the victors of the First World War, geopolitically the satisfied powers, the 'haves'. They did not glorify war or even prioritize national defence. They were even prepared to attempt to work together with (or appease) extreme ideological opponents. The arms race was driven in Germany, Italy, and Japan by an ideology of revisionism and a glorification of war, and in the USSR by institutional paranoia and actual international isolation. The democracies in contrast *reacted*, if too slowly, to forces from outside.

All three pressures—technological, external, and internal—were at work in the arms dynamic in the inter-war years, but they had very different weights at different times and in different countries. The USSR began developing (or re-developing) its land armaments earliest and most rapidly, and the United States and Britain only began to do so after 1938–9. Ultimately, however, the greatest pressures of the arms dynamic were political and related to the expansionist or revisionist programmes of the 'new order' countries, and especially those of the Nazi government that took power in Germany in 1933.

LAND ARMAMENTS: LONG-TERM COMPARISONS

How did the competition in land armaments in the period before 1939/1941 differ from similar events of the first half of the last century? Comparing the three episodes—pre-1914, pre-1939/1941, and Cold War—the middle one was the one for which land-armaments were arguably the most important single dimension, especially in Europe.[73] The pre-1914 arms competition, which was essentially European, had a very significant naval dimension; the Cold War arms race was above all about strategic nuclear weapons.

At the risk of stating the obvious, another distinctive feature of the pre-1939/1941 arms competition was that it came *after* the pre-1914 arms race and *after* the First World War. Unlike the situation before 1914, policy-makers in the 1920s and 1930s were aware that an arms race could have the most serious consequences. Famously, Edward Grey, the former British foreign secretary, recalled in his 1925 memoirs that the growth of armaments had made war inevitable in

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[72] Knox, *Common Destiny*, 109–10.
[73] The pre-1939/1941 situation in the Pacific was admittedly more complex, with Japan engaged in a land-armaments competition against the Soviet Union (but not against the US), and a naval armaments competition with the US (but not against the USSR).

1914.[74] Half a decade later, at the opening of the Geneva disarmament conference in 1932, another British statesman, Arthur Henderson, had argued that the 'generations of today' recognized that 'there is no graver or more certain menace to peace and security than the maintenance of formidable armaments'.[75]

The arms competition before 1939/1941 was relatively asymmetrical. Dennis Showalter has argued that prior to the 1914–18 war, and during it, the world's armed forces had been fairly similar to one another, but '[t]his military symmetry vanished in the aftermath of the Versailles Treaty'.[76] One feature of this development was that the arms race before 1939/1941 involved a major element of *rearmament*, certainly on the part of the Russians and the Germans. The major-power arms competitions before 1914 and after 1945 involved major participants that were already heavily armed.[77] Another important asymmetry in the 1930s was that some armies were configured for offensive operations and short wars (and expected to be engaged in them), and others were configured for defensive operations and long wars (and hoped to avoid them).

The experience of 1914–18 also conditioned the later arms competitions. Joe Maiolo has argued that the inter-war arms race (not just in land armaments) was different from the others, because of contemporary assumptions about the nature of future total war: the experience of the First World War seemed to suggest the need to mobilize the entire economy for war.[78] This 'lesson' was to some extent overtaken by the advent of nuclear weapons in 1945.[79] Both before 1914 and after 1945 the main expectation was generally for a short war, although the reasons for that expectation were radically different in the two periods. The land-armament 'in depth' strategy did not prove to be an effective means of *deterring* war, either by the British and French against Nazi Germany and fascist Italy, or by the British and Americans against imperial Japan. Land armament in depth was, however, a way of *winning* a longer-term war.

One of the three arms competitions was not followed by a general war. The Cold War arms race—even the competitive build-up of conventional forces in central Europe—did not lead to war; neither side wished to undo the status quo, and the possibility of nuclear escalation had made war too destructive to contemplate. The arms race before 1914, in contrast, came at a time when the destructive potential of a general war was underestimated; arms competition was part of an explosive cocktail of elements that led to a general conflict.

[74] Edward Grey, *Twenty-Five Years, 1892–1916*, vol. 1 (London, 1925), pp. 89–90. See citation in Stevenson, *Armaments*, 1, and Maiolo, 'Arms Competition', 286.

[75] 'Opening Speech', First Plenary Meeting [of Geneva Disarmament Conference, 2 February 1932, p. 40. http://lgdata.s3-website-us-east-1.amazonaws.com/docs/1948/380464/Arthur_Henderson_opening_speech_1932_wm.pdf.

[76] Showalter, 'Military Innovation', 220–2. As regards the situation before 1918, however, this stimulating generalization is truer for land armaments than naval ones.

[77] In the 1950s France, Germany, Italy, Japan rebuilt their armies under American supervision, and East Germany, Poland, and Czechoslovakia did so under that of the Soviets. By this time, however, these states were relatively minor participants.

[78] Maiolo, 'Armaments Competition', 289–90. This argument is developed at length in *Cry Havoc*.

[79] This statement is over-simplified, bearing in mind such Cold War notions as 'flexible response'. But planning after 1945 was not as concerned about resources as it had been before 1939.

Relatively speaking, arms competition was less important as a cause of general war in 1939/1941 than it had been in 1914. The land-armaments build-up of the 1930s was fundamentally driven by internal—structural—factors: the political ideologies and aggressive (or paranoid) foreign policies of Germany, Italy, Japan, and the USSR. The 'arms race', as such, was the belated reaction of France and Britain (and to an extent the USSR) to the build-up in Germany, and to a lesser extent to those in Italy and Japan. Ideology was thus more important than the 'arms race' as a causal factor in the outbreak of general war in 1939/1941.[80] What happened in 1914 was an altogether more surprising event; the major powers became involved in a *general* war to some extent inadvertently, and in this development the arms race played a part. In contrast, a major war (with Poland) in 1939 was brought about intentionally, and by political and military leaders who were prepared to accept the risk of general war; there was also nothing inadvertent about the beginning of the war with the USSR in June 1941.[81] The arms race before 1939 took place at a time when some of the major powers had a dread of a general conflict, but others cold-bloodedly planned to fight a war of aggression, and they regarded arms as the instrument of conquest rather than a means of deterrence. There was a 'race' only in the sense that Germany and Italy saw a window of opportunity, a time when their land forces would be at their peak, relative to potential opponents.

If arms races can be seen as the cause of (some) wars, opting out of the arms race—in whole or in part—can also be seen as a cause of war, a failure to deter aggression. Opting out of the land-armaments race—arguably the attempted policy of Britain and the United States in the 1920s and 1930s—did not help. On the other hand, what was probably the most extensive 'peacetime' competitive build-up of land armaments of the era, involving the Soviet Union and Germany before 22 June 1941, had little impact on the outbreak of war between the two states. The Soviet Union failed to deter Germany, despite a huge productive effort.[82] At the same time, Germany did not go to war with the USSR because Hitler or his high command felt threatened by the actual or potential Red Army or because they wanted to launch a pre-emptive strike. (Later, *after* the *Wehrmacht*'s first defeats, the Soviet build-up was developed in German propaganda as an *ex post facto* threat.) On the other hand I would also argue that the arms competition in the Far East was 'won' by the Russians, and it deterred war with Japan until August 1945.

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[80] Significantly, the new volume of the *Cambridge History of War* has a chapter about an arms race before 1914, but not one about an arms race in the period before 1939: Antulio J. Echevarria, 'The Arms Race: Qualitative and Quantitative Aspects', *Cambridge History of War* 4 (4 vols., Cambridge, 2012), pp. 163–80.

[81] Arguably the outbreak of the Sino-Japanese War in July 1937 was also inadvertent; however, this was not the case with the outbreak of the Japanese war against Britain and the United States in December 1941.

[82] I do not accept that argument that the Soviet build-up was intended for an offensive war against Germany in 1941 or 1942. For the latest version of this see Viktor Suvorov, *The Chief Culprit: Stalin's Grand Design to Start World War II* (Annapolis MA, 2008).

Historical events are unique. The growth of land-armaments, peaking in Europe between 1936 and 1939/1941, was different from the growth of naval and air armaments in that same period. It was different, too, from land-armaments competition before 1914, and after 1945. An important distinction must be made between competition in land armaments, and in naval or air armaments, and the preparation of a 'war economy' in general. Finally, it is difficult to see the competitive growth of land armaments as a cause of war in 1939 (or 1941); this was a secondary issue compared to powerful ideological factors.

4

Naval Armaments Competition Between the Two World Wars

Joseph Maiolo

The study of inter-war naval armaments highlights the interrelatedness of arms control and arms racing. As Barry Buzan and Eric Herring argue, arms control works when it mitigates the international, domestic, and technological pressures that turn routine military relations between states into arms races.[1] While the spur of technological change, the action-reaction cycle of reciprocal warship building, and domestic industrial-political imperatives all feature in this chapter, even in combination these three standard explanatory models for arms races are insufficient to account for the varying intensity of competitive naval building between the two world wars. A full explanation for the development of naval arms limitation in the 1920s and 1930s, and the unfolding of a naval arms race before the Second World War, lies in the connection between naval armaments and larger trends in international politics.[2]

To analyse the drivers and the international context of naval competition, I have divided the inter-war period into three phases. Phase one began with the Washington naval treaty of February 1922. That treaty codified a common desire among the naval powers—Britain, the United States, Japan, France, and Italy—to avert a naval race as well as a willingness to manage the future naval balance. As we shall see, political disputes and technological developments caused friction between the naval powers in the 1920s, but these quarrels never threatened to initiate a return to all-out naval rivalry. Phase two began in the early 1930s, when the naval powers started to plan for, and to rebuild, their fleets, and when the global economic and political system entered an extended crisis that would lead to global war. During this second phase, Britain, the great power that had benefited the most from naval limitation, and that had the most to gain from its perpetuation, sought a new deal on naval arms control to manage the pace and character of global naval arms expansion to its advantage. Phase three began with the London naval treaty of

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[1] Barry Buzan and Eric Herring, *The Arms Dynamic in World Politics* (London, 1998), 211–29; Jeffrey A. Larsen, ed., *Arms Control: Cooperative Security in a Changing Environment* (London, 2002), 5–11. Although contemporaries used the terms disarmament and arms limitation interchangeably to refer to the negotiation of the naval treaties, this chapter will use the now more familiar term arms control.

[2] Buzan and Herring, *Arms Dynamic*, 3–5.

March 1936, which marked a short-lived success for British diplomacy. Unfortunately for Britain, this phase also witnessed the opening moves in a full-blown naval arms race cut short by the outbreak of war.

In Chapter 2 of this volume David Stevenson argues that the pre-1914 arms races on land bore more directly on the coming of war in Europe than competitions at sea. A similar causal relationship holds true for the Second World War. As the present author has argued elsewhere, land and air races between the great powers and the spiral of competitive economic mobilization for total war were more critical to determining the timing of the outbreak and escalation of the conflict than was competitive warship building. Even Japan's now-or-never decision for war in December 1941 was shaped much more by shrinking access to industrial resources than by the shifting naval balance.[3] One reason for the peripheral importance of naval armaments to the coming of the war was the long lead time required to build large warships. Blueprints for war-winning fleets piled up much faster than the shipyards could respond. Battleships were also materially and symbolically tied to the post-1919 liberal order and the dominance of London and Washington in world affairs. It is thus no surprise that an *open* challenge by the revisionist powers to the naval dominance of the two English-speaking *status quo* powers materialized late in the pre-war sequence of arming, counter-arming, and alliance formation.

PHASE I: AN ACTION-REACTION SPIRAL AVERTED BY DIPLOMACY, 1919–1930

The origins of naval arms control after the First World War lends support to the theory that arms races begin as rational responses to threatening shifts in the military balance.[4] Two wartime changes to the security environment at sea made a radical post-war readjustment of some sort certain. The first was the destruction of the German, Russian, Austro-Hungarian, and Ottoman fleets, which removed these powers from the post-war naval balance. The second was the spectacular rise of the US Navy. In 1916, fearing that Britain's blockade and Germany's U-boats would threaten American interests, or that a victorious Germany allied with Japan would menace the United States, President Woodrow Wilson signed the 'Big Navy Act' to counter these dangers. In the first year of the Navy Act, Congress authorized the construction of sixty-six warships, including four battleships, four battlecruisers, four cruisers, twenty destroyers, and thirty submarines. In 1917 the Navy Act was expanded to ten battleships, six battlecruisers, and additional auxiliaries to give the US a navy 'second to none'.[5]

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[3] Joseph A. Maiolo, *Cry Havoc: How The Arms Race Drove The World To War, 1931–1941* (New York, 2011), 211–369.

[4] Charles L. Glaser, 'The Causes and Consequences of Arms Races', *Annual Review of Political Science* 3 (2000), 251–76.

[5] William J. Williams, 'Josephus Daniels and the US Navy's Shipbuilding Program During World War I', *Journal of Military History* 60 (1996), 7–38.

The swift growth of the US Navy challenged Tokyo's and London's relative naval standing, and added momentum to a competitive cycle of action and reaction between the three largest of the victorious naval powers. From 1907 Japanese defence policy had identified the US Navy as Japan's hypothetical foe and had set a 70 per cent ratio in relation to the US fleet as the navy's target. Washington's war-time expansion plans, however, inflated the US Navy's growth beyond Japanese projections. In November 1918, to keep pace with the US Navy, the Japanese added eight more battleships to the existing plan for a fleet of sixteen modern battleships and battlecruisers.[6] With the surrender of the German fleet, the Royal Navy emerged from the war as the world's most powerful navy. However, the US Navy's building plans would give the US a fleet larger and more modern than Britain's. In 1919 talks in Paris to set the naval balance between the two English-speaking powers failed.[7] By the spring of 1921 British officials faced a choice between ceding naval supremacy to the Americans or engaging in a naval race. At first the British reacted much as they did to the pre-1914 German naval menace masterminded by Admiral Alfred von Tirpitz. As Matthew Seligmann shows in Chapter 1 of this volume, Admiral Sir John Fisher replied to the Tirpitz Plan with a strategy he called 'plunging', by which he meant relentlessly forcing the pace of innovation in warship technology to achieve supremacy at sea. In a similar fashion, in 1920 the British replied to the United States and Japan with new capital ship designs qualitatively superior to the latest American and Japanese designs, and thus stoked an arms race in the quality as well as numbers of ships. By November 1921, Britain had started to build or had placed orders for eight new capital ships, the US had laid down fifteen, and Japan had begun to build or ordered fourteen. Displacing between 40,000–50,000 tons and armed with 16- or 18-inch guns, these vessels marked a huge technological leap forward in firepower and protection over all earlier big-gun-ship designs.[8]

To contemporaries this escalating action-reaction cycle in capital ship numbers and quality appeared to be a dangerous repetition of the pre-war European naval races. As theorists suggest, however, arms races need broad domestic political sup-port and influential military-industrial elites to sustain them.[9] In this case, the internal drivers everywhere were weak. Demobilization, retrenchment and, in Italy and France, reconstruction, dominated the post-war domestic politics of the major powers. In the United States, the drive for government cost cutting was so strong that it alarmed the US Navy's General Board. President Woodrow Wilson had no

[6] Sadao Asada, *From Mahan to Pearl Harbor: The Imperial Japanese Navy and the United States* (Annapolis Maryland, 2006), 51–5; David C. Evans and Mark R. Peattie, *Kaigun: Strategy, Tactics and Technology in the Imperial Japanese Navy 1887–1941* (Annapolis MD, 1997), 141–75.

[7] J. Kenneth McDonald, 'The Washington Conference and the Naval Balance of Power, 1921–22' in John B. Hattendorf and Robert S. Jordan, eds., *Maritime Strategy and the Balance of Power: Britain and America in the Twentieth Century* (London, 1989), 189–213.

[8] John Jordan, *Warships After Washington: The Development of the Five Major Fleets 1922–1930* (Barnsley, 2011), 1–24.

[9] Buzan and Herring, *Arms Dynamic*, 101–18; cf. Sean Bolks and Richard J. Stoll, 'The Arms Acquisition Process: The Effect of Internal and External Constraints on Arms Race Dynamics', *Journal of Conflict Resolution* 44/5 (2000), 580–603.

intention of engaging in a costly arms race. In 1919, he agreed with his naval advisors that in principle parity with Britain should be the navy's goal, but for him the US naval plans of 1916–17 were bargaining chips to be traded in talks with London over a range of issues.[10] In Japan austerity was pressing because the economy had fallen into the first of a series of post-war slumps. In 1921 Japan's state spending on naval arms had reached an unsustainable 31.6 per cent of the total national budget. Naval planners knew that Japan had reached the limit of it effort as the US and Britain began to gear up.[11] Similarly, although British officials warned their US counterparts that Britain would spend its last shilling on the fleet before ceding superiority, this was more bluster than a genuine threat. Prime Minister David Lloyd George concluded that a naval arms race would end in 'bankruptcy or war', and Admiralty planners calculated that Britain did not possess the money and industrial potential to stay ahead of the US Navy.[12] The British problem was compounded by the fact that the new capital ships would displace 45,000 tons and more, which would require a huge investment in new infrastructure to support such vessels. Ultimately, when US Congressman Frederick Hicks of the Naval Affairs Committee boasted at a public gathering in July 1921 that 'we have the wealth, the material and the man power to outstrip in a naval programme any and all nations', he was merely stating a fact well know to many officials in Tokyo and London.[13]

Fortunately for London and Tokyo, the new Republican President Warren G. Harding did not want to build the world's biggest navy. After Wilson's defeat in Congress over US membership of the League of Nations, Harding looked for a positive popular step in world affairs that would also cut taxes at home. The invitation issued by Charles Evans Hughes, Harding's secretary of state, to the naval powers to send delegations to Washington in November 1921 to halt the naval rivalry thus made sense as a move both in US domestic politics and in foreign policy.[14] Several factors explain why this initiative resulted in a deal. The first was the willingness of Hughes to override the opposition of his naval advisors to scrapping new ships already laid down. On the opening day of the conference, he surprised everyone by calling for an immediate halt to all work on ships under construction and the scrapping of many of the world's warships. The second factor was a recognition by key men in Tokyo and London, who, like Hughes, overrode the hawks in their security communities, that the worse outcome to the conference would be to provoke the Americans into converting their financial and industrial potential into a navy 'second to none'. British and Japanese officials correctly judged that the domestic drivers behind US naval growth were weak and that Washington's goals

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[10] David F. Trask, 'William Shepherd Benson', in Robert W. Love, ed., *The Chiefs of Naval Operations* (Annapolis MD, 1980), 17–18.

[11] Asada, *From Mahan to Pearl Harbor*, 54.

[12] John Ferris, '"It Is Our Business in the Navy to Command the Seas": The Last Decade of British Maritime Supremacy, 1919–1929', in Keith Neilson and Gregory C. Kennedy, eds., *Far Flung Lines: Studies in Imperial Defence in Honour of Donald Mackenzie Schurman* (London, 1997), 129–34.

[13] Jordan, *Warships After Washington*, 1, 25–30.

[14] Thomas H. Buckley, 'The Icarus Factor: The American Pursuit of Myth in Naval Arms Control, 1921–36', *Diplomacy & Statecraft* 4 (1993), 124–46.

were moderate, and so they adopted the policy of placating the Americans. Japan's navy minister, Admiral Kato Tomosaburo, who led his nation's delegation to Washington, saw that Hughes's 'halt now' proposal would freeze Japan's naval strength at the maximum that was financially and industrially sustainable, and fix the US Navy at well below its maximum potential strength.[15] As John Ferris argues, long before the conference, Lloyd George and other British officials grasped that they should not goad the Americans into a naval race, but instead they should negotiate to preserve a level of naval strength sufficient to defend the empire. The difficult pill for the British to swallow was the American demand for parity in the form of a battleship and aircraft carrier tonnage ratio of 5:5:3:1.75:1.75 for Britain, the US, Japan, France, and Italy. This shifted the focus of naval arms politics from the realm of national strategic requirements to the symbolic and politically explosive one of national honour and prestige. Despite protests from the Admiralty and its hawkish political backers, however, London made the symbolic concession to Washington of formal parity, but sought to retain concrete advantages in the detailed negotiations.[16]

To be sure, the Washington naval treaty rested on a series of mutually beneficial trade-offs and pay-offs, including reduced naval defence burdens. Arguably, though, Britain came out ahead because it scrapped old ships in exchange for the US and Japan halting work on new ones. The treaty allowed Britain to build two new 16-inch-gun battleships to adjust for the relative age of its capital ships. By defining qualitative limits for each ship category (for example 35,000 tons and 15-inch guns for capital ships and 10,000 tons and 8-inch guns for cruisers) the treaty also relieved Britain of the need to invest in the facilities required to support much larger vessels. Britain and France successfully resisted American efforts to extend the tonnage ratios to cruisers on the basis that they needed more of these ships to defend their far-flung empires and overseas trade. This concession benefited Britain greatly. Not only did the Royal Navy possess the world's largest cruiser fleet: it also had a global network of naval bases and a large reserve of commercial ships that could be converted to armed merchant cruisers, all of which made it the only power capable of waging intercontinental blockade.[17] As Admiral Kato Tomosaburo had anticipated, the treaty recognized the Japanese Navy as the world's third largest and fixed the naval balance at the point most favourable to Japan. Harding and Hughes achieved a foreign policy success that slashed the naval budget. They also secured the US foreign policy goal of terminating the Anglo-Japanese alliance, though by 1921 the basis for cooperation between Tokyo and London had been eroded.[18] The French dealt with the Italian demand for naval parity in the same way as the British dealt with the American one: they accepted

[15] Asada, *From Mahan to Pearl Harbor*, 69–78.

[16] John R. Ferris, 'The Symbol and the Substance of Seapower: Great Britain, the United States and the One-Power Standard, 1919–1921', in Brian J. C. McKercher, ed., *Anglo-American Relations in the 1920s: The Struggle for Supremacy* (London, 1991), 55–80.

[17] Ferris, ' "It Is Our Business in the Navy to Command the Seas" ', 129–31, 134–7.

[18] Phillips P. O'Brien, 'Britain and the End of the Anglo-Japanese Alliance', in Phillips P. O'Brien, ed., *The Anglo-Japanese Alliance, 1902–1922* (London, 2004), 267–84.

the blow to French prestige by conceding parity on paper on the assumption that Italy would never have the resources to match them at sea ton for ton anyway.[19]

The Washington naval treaty included two features of significance for arms control/arms race theory. The first was a ten-year capital ship building holiday (with a few exceptions to balance the fleets) and the second was a timetable for the scrapping and the replacement of capital ships from 1933 to 1945, which would end with Britain and the US operating fifteen capital ships each, Japan with nine, and France and Italy with five each. The treaty's inclusion of these two measures corresponds with the deductions made from models based on the logic of the 'repeated prisoner's dilemma', which suggests that the fear that fuels the piling up of arms in a 'security dilemma' is reduced when the uncertainty about a rival's future moves and the game's outcome is reduced.[20] Yet, as theorists point out, successful arms control does not stop arms rivalry or alter the politics of arms acquisition; it only reduces the self-defeating consequences of uncontrolled rivalry and redirects the competition into unregulated areas.[21] So it was with the Washington naval treaty. The battleship-building holiday put an end to competition in that category, so the naval powers instead began to build-up their fleets of submarines, destroyers, and cruisers. Most of this naval work was driven by the technological requirement to modernize these auxiliary vessels and what the political scientist James R. Kurth called the 'follow-on imperative': in other words, the need to maintain and reno-vate the naval-industrial production base with a steady diet of state contracts without which it would wither and die.[22] However, the swift build up of one type of auxiliary vessel did touch upon one sensitive point of security and threat percep-tion among the naval powers, and that was the 'Washington standard' cruisers of 10,000 tons armed with 8-inch guns.

Rivalry in Washington-type heavy cruisers soured relations between Washington and London. After the Washington conference, the Royal Navy adopted an ambi-tious cruiser building plan to create a mixed fleet of seventy Washington-type and lighter 6-inch-gun vessels for fleet work, trade defence, and blockade. From 1922 to 1926 the Admiralty secured funds for a burst of naval construction, and overall laid down almost as much tonnage as Japan and the US combined. That Congress did not fund an equally ambitious US cruiser building plan compounded the irritation felt by many US naval officers that the US had been cheated by Britain out of real tonnage parity at Washington. By the spring of 1926, the Royal Navy had nine Washington-type cruisers built and building, Japan had eight built or building, and France and Italy had two each under construction: while the US Navy had yet to lay down its first. In February 1927 President Calvin Coolidge ignored the US Navy's

[19] Joel Blatt, 'The Parity That Meant Superiority: French Naval Policy towards Italy at the Washington Conference, 1921–22', *French Historical Studies* 2/2 (1981), 223–48.
[20] For an application of the prisoner's dilemma to arms races/arms control see George W. Downs and David M. Rocke, *Tacit Bargaining, Arms Races and Arms Control* (Ann Arbor, Michigan, 1990); Andrew Kydd, 'Arms Races and Arms Control: Modeling the Hawk Perspective', *American Journal of Political Science* 44/2 (2000), 228–44.
[21] For instance Buzan and Herring, *Arms Dynamic*, 211–12, 221–7.
[22] James R. Kurth, 'The Political Economy of Weapons Procurement: The Follow-on Imperative', *American Economic Review* 62/2 (1972), 304–11.

supporters on Capitol Hill who wanted to respond to Britain and Japan with a pledge to close the heavy cruiser gap by expanding the fleet; instead he called for a new naval treaty to extend the Washington tonnage ratios to auxiliaries.[23] In June–August delegates from Japan, Britain, and the US met at Geneva and agreed to limits on submarines and destroyers, but failed to agree on cruiser limits. Unlike five years earlier at Washington, at Geneva the incompatible views of naval authorities asserted themselves over those of the political leadership. The British wanted to cap the number of heavy cruisers, but not light ones (6,000 tons), while the Americans wanted to fix both navies at forty-five ships each (twenty-five heavy and twenty light cruisers). The conference thus broke up in a storm of mutual recrimination. In reaction to the diplomatic impasse, the US Navy received authorization to lay down five Washington-type cruisers a year from 1929 to 1931, a total of 15 that would be added to the eight already under construction.[24]

Some journalists and naval planners saw the cruiser dispute as evidence of a coming Anglo-American war. The epic maritime wars of the past had been triggered by commercial and naval rivalry during the transition between rising and declining sea powers (so ran the spurious historical reasoning), and relations between London and Washington would conform to that pattern.[25] Britain and the US, however, valued and benefited from the *status quo*. Their dispute touched on vital issues of security and status (including a clash between the US doctrine of freedom of the seas and the British one of maritime belligerent rights), but both desired peace and so restrained the pace and magnitude of their naval rivalry. In fact the cruiser dispute stemmed from opposing but not entirely clashing strategic imperatives. American naval planners preferred the endurance of the 10,000-ton/8-inch-gun cruisers to execute their trans-Pacific war plan against Japan (War Plan Orange); the British needed a big fleet of lighter 6-inch-gun ships to defend their oceanic trade and to enforce a blockade, and they did not want these vessels to encounter too many of the more powerful 8-inch-gun cruisers in a future war. Both of these liberal great powers valued and trumpeted world disarmament as a 'public good' in and of itself, but also sought to achieve self-interested strategic goals alongside it. For the Harding, Coolidge, and Herbert Hoover administrations, a world of small navies not only made the US safe from invasion and blockade, but it also reflected the Republican vision of a small state, low taxes, and an America aloof from faraway conflicts. The United States was an autarkic continental power with a big fleet; Britain was a maritime empire reliant on its big navy to be a great power, to exert influence in world politics and to protect the imperial sources of its strength. For the

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[23] Jordan, *Warships After Washington*, 108–52, 287–94; Ferris, ' "It Is Our Business in the Navy to Command the Seas" ', 137–40; John T. Kuehn, 'The US Navy General Board and Naval Arms Limitation, 1922–1937', *Journal of Military History* 74/4 (2010), 1129–60.

[24] Christopher Hall, *Britain, America, and Arms Control, 1921–1937* (London, 1987), 36–58; Tadashi Kuramatsu, 'The Geneva Naval Conference of 1927: The British Preparations for the Conference, December 1926 to June 1927', *Journal of Strategic Studies* 19/1 (1996), 104–21.

[25] John Gooch, ' "Hidden in the Rock": American Military Perceptions of Great Britain 1919–1940', in Freedman, L. (ed.), *War, Strategy and International Politics* (Oxford, 1992), 155–74; Christopher M. Bell, 'Thinking the Unthinkable: British and American Naval Strategies for an Anglo-American War, 1918–1931', *International History Review* 19/4 (1997), 789–808.

British, naval arms control was above all a tool for restraining the naval building programmes of other powers to Britain's strategic benefit.[26]

That in the end London and Washington resolved this dispute affirms the theoretical proposition that *status quo* powers caught in a competitive arms dynamic driven by a security dilemma will seek to defend their positions through diplomacy and reassurance rather than armed threats and war.[27] The deadlock over the cruiser dispute broke in 1929 when Hoover took the White House and Ramsay MacDonald entered Downing Street. Both men sought to settle the cruiser issue despite the resistance of their senior naval advisors. The British prime minister saw success at the 1930 London naval conference as one part of a much more ambitious goal of achieving world disarmament through negotiations organized by the League of Nations. For that reason he forced the Admiralty to accept the American position on cruisers. The 1930 London naval treaty set a tonnage ratio for cruisers and destroyers of 5:5:3.5 for the US, Britain, and Japan, which meant that the Royal Navy had to reduce its relatively modern cruiser force to parity with the US Navy. France and Italy, however, failed to agree on cruiser parity. The 1930 London naval treaty called for further cuts in battleship numbers and it extended the capital ship building holiday for more five more years (until 1936). MacDonald predicted that successful world disarmament negotiations would create a more stable world by substituting 'the security of peace for that of military preparation'.[28] However, as the 1930s would show, MacDonald's optimistic reasoning about the link between arms and international stability was flawed because it was based largely on the narrow experience of naval bargaining between the two dominant liberal *status quo* powers.

PHASE II: ARMS CONTROL AS AN ARMAMENTS STRATEGY, 1930–1936

The onset of the Great Depression, Japan's conquest of Manchuria (1931–3), the failure of the World Disarmament Conference (1932–4), the advent of the Nazi regime in Germany (1933), and the Italian invasion of Ethiopia (1935), all marked a seismic shift in international politics. This period of radical change in world relations coincided with the period of planning for battleship replacement and renewed naval arms control talks scheduled in 1922 at the Washington conference. Not

[26] M. A. West, *Laying the Legislative Foundations: The House Naval Affairs Committee and the Construction of the Treaty Navy, 1926–34* (PhD Thesis, Ohio University, 1972); Joseph A. Maiolo, *The Royal Navy and Nazi Germany, 1933–1939* (Basingstoke, 1998), 11–19, 63–6, 111–20; Scott Keefer, 'Great Britain and Naval Arms Control: International Law and Security 1898–1914' (PhD Thesis, London School of Economics, 2011).

[27] Buzan and Herring, *Arms Dynamic*, 97–8.

[28] Brian J. McKercher, '"A Certain Irritation": The White House, the State Department, and the Desire for a Naval Settlement with Great Britain, 1927–1930', *Diplomatic History* 31/5 (2007), 829–63; Christopher M. Bell, 'Great Britain and the London Naval Conference', John H. Maurer and Christopher M. Bell, eds., *At the Crossroads Between Peace and War: The London Naval Conference of 1930* (Annapolis MD, 2014), 7–87.

only did the environment in which the naval powers discussed a replacement for the Washington naval treaty change markedly, but the balance of interest in a new treaty had also shifted dramatically. Successful naval arms control and a decade of peacetime naval growth became *vital* to Britain's future as the world's leading sea power just when achieving those two conditions became improbable. For the US did not value a new treaty as highly as Britain, the Japanese Navy rejected naval disarmament, and Germany and the Soviet Union regarded naval arms control as cover for revisionist ambitions at sea.

To appreciate why a new naval treaty became vital to Britain, we need to understand the impact of the Great Depression on the British warship industry in terms of Kurth's 'follow-on imperative'. Under the original terms of the Washington treaty, battleship replacement would have begun in 1931. In the 1920s, with a diet of orders and subsidies, the Admiralty preserved enough capacity in the private and state sectors not only to replace the battleship fleet as scheduled at Washington, but also to expand the navy and to lay down a crash programme to trump aggressive building by rivals. However, thanks to the cut in cruiser construction, the five-year extension to the battleship building holiday, and the impact of the industrial slump, the warship and mercantile sectors contracted dramatically: from 1929 to 1935, British capacity, including large slipways, specialist labour, and armour plate firms, shrank by one half.[29] The economic downturn forced shipbuilders the world over into bankruptcy, and surviving firms scrapped unprofitable plant and let go of skilled workers, but Britain's industry suffered more than any other from the break in 'follow-on' orders because of its huge spare capacity. Although one would expect that during a global crisis in shipbuilding private shipbuilders would inflate the demand for warships by lobbying officials for state contracts, there is very little evidence of this kind of domestic imperative at work; on the other hand there is plenty of evidence of navies, above all the Royal Navy, fretting about the financial health of the private shipyards they needed to build their warships. Fortunately for the US Navy, American shipbuilders had nearly full order books for civilian ships to sustain them until 1934. French, Italian, and Japanese firms survived on state orders and subsidies. After 1934 Germany expanded its small shipbuilding industry with a surge of new orders. And Russian shipyards enjoyed huge investment in the second Five Year Plan (1933–7).[30]

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[29] Ferris, '"It Is Our Business in the Navy to Command the Seas"', 76–95; Jon T. Sumida, 'British Naval Procurement and Technological Change, 1919–39', Phillips P. O'Brien, ed., *Technology and Naval Combat in the Twentieth Century and Beyond* (London, 2001), 128–47.

[30] Robert H. Levine, *The Politics of American Naval Rearmament, 1930–1938* (PhD Thesis, Harvard University, 1972), 51–61; William M. McBride, 'The Unstable Dynamics of a Strategic Technology: Disarmament, Unemployment, and the Interwar Battleship', *Technology and Culture* 38 (1997), 386–423; Cristiano A. Ristuccia, *The Italian Economy under Fascism* (DPhil Thesis, University of Oxford, 1999), 225–33; Robert Frankenstein, *Le Prix du réarmement français, 1935–1939* (Paris, 1982), 44–6, 224–5; Andrea F. Saba, 'Fascismo e mito dell'efficienza: consorzi e produzione navale per l'estero', *Italia Contemporanea* 197 (1994), 777–89; Tomohei Chida, and Peter N. Davies, *The Japanese Shipping and Shipbuilding Industries: A History of their Modern Growth* (London, 1990), 14–56; Jost Dülffer, *Weimar, Hitler, und die Marine: Reichspolitik und Flottenbau, 1920 bis 1939* (Düsseldorf, 1973), 225–79; Lennart Samuelson, 'The Naval Dimension of the Soviet Five Year Plans, 1925–1941', in William M. McBride, ed., *New Interpretations in Naval History* (Annapolis MD, 1998), 203–27.

Even after the forced rationalization of Britain's shipbuilders in the early 1930s, the British retained the world's largest shipbuilding industry. Yet between 1936 and 1941 the Royal Navy would undergo a period of vulnerability because during those years the remaining capacity would be sufficient only to replace old ships with new ones. Expansion of the fleet to a size large enough to fight Japan and deter the largest European fleet (the two-power standard), as the Admiralty planned, would have to wait until the 1940s. The danger in this situation lay in a premature naval arms race. If Japan, the United States, France, Italy, Germany, and the Soviet Union started to build warships at top speed before 1941, Britain would not have the industrial depth to match them all ship for ship. To pass through this period of industrial vulnerability, the Admiralty needed to achieve internal and external goals. Internally, it had to persuade top decision makers that massive spending on the navy made strategic sense at a time when the threat from the *Luftwaffe* gripped the nation and Parliament. By 1936 the bomber had become the icon of future apocalyptic warfare, and the admirals struggled in what proved to be a losing budgetary battle against the air chiefs. It would be wrong, however, to conclude that British naval arms growth was driven primarily by the organizational needs of a navy locked in a budgetary battle with an air force, because the external threats to Britain's naval standing were real enough. Inside the British government there was a dispute about how much could be spent on the fleet to meet those threats, but there was a consensus on the strategic utility of naval arms control. Externally, Britain's task was analogous to that of a runner who needed to persuade his opponents to run a bit slower (at least for a time) so that he could cross the finishing line first. To co-opt the other naval powers into moving slowly enough for Britain to pass through its period of industrial vulnerability, British naval officers and diplomats hoped to replace the expiring 1922 Washington and 1930 London naval treaties with one that would prevent a naval race from breaking out before Britain was in a position to win it.[31]

The British Foreign Office and Admiralty concluded that doing away with the Washington tonnage ratio system and promoting the twin principles of transparency in warship construction plans and conformity with internationally agreed qualitative standards were the keys to managing naval rivalries. One lesson that British admirals and diplomats had learned from the 1920s was that nothing inflamed national pride or sparked rivalry at sea more than the Washington tonnage ratios. Britain's quarrel with the Americans over parity, especially in cruisers, Italy's insistent claim for equality with France, and Japan's demand in the early 1930s for parity with Britain and the US in a new treaty, all seemed to confirm that wounded *amour propre* was the true driver behind bigger fleets. British diplomats and admirals believed that if the sea powers did away with the explicit pecking order enshrined in the Washington tonnage ratios, then the size of navies would soon come to reflect basic differences in national strategic needs and state resources. In other words, the global naval balance would settle down to what British admirals

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[31] Maiolo, *Royal Navy*, 11–19, 133–58.

regarded as the natural global order at sea: the Royal Navy on top, followed in close order by the US Navy, the Imperial Japanese Navy, and then all the others.[32]

While the very narrow focus on the ratio system as the internal driver of naval rivalries was mistaken, the British plan to promote the twin principles of transparency and conformity in warship building chimes with current theoretical studies of treaty compliance that stress the importance of reducing uncertainty about future military capabilities as being essential to stable arms control.[33] The 1922 Washington and 1930 London treaties had required signatories to disclose the dimensions and features of their new ships once the keels were laid. In the new treaty, the British proposed even greater information sharing, including the circulation of annual shipbuilding plans and data about each new vessel. The British believed that regular declarations of intent would reduce mistrust and provide everyone with a predictable basis for naval arms planning. The same was true for British proposals on qualitative standards. As the pre-1914 and post-1919 competition in capital ships had shown, naval arms races tended to be both quantitative and qualitative. Instead of building more ships of a similar type to those of a rival, one could achieve an advantage by assembling larger, better-armoured, and more heavily armed ships than the rival's best: or, alternatively, by sacrificing one of the three main design features (speed, protection, and fire power) to amplify another. While Britain's warship industries were at the limits of their capacity to replace old ships with new ones, it made sense for the British to strengthen the international rules for warship standardization by setting the size and gun power of each category of vessel in the new treaty, and thereby reducing the incentive for any one power to steal an advantage by 'going one better' qualitatively.[34]

Placing arms control at the centre of an arms strategy may not have been as spectacular as Admiral Fisher's strategy of forcing Germany to withdraw from the pre-1914 naval race through qualitative innovation, but the attempt to control global naval arms growth through diplomacy to protect Britain's supremacy at sea was no less ambitious. In the early Cold War, Washington and Moscow employed a similar approach to defend their nuclear supremacy through the nuclear non-proliferation regime.[35] The recurrence of this approach shows that sceptics such as Colin S. Grey, who argue that arms control is only feasible when it is unnecessary because peaceful conditions prevail anyway and is dangerous in other instances because it weakens status quo states and encourages aggressors, overlook a key point: one way in which leading powers can prolong their preponderance and strategic advantage is precisely through arms control.[36]

From this perspective, the speed with which the British agreed to the Anglo-German naval agreement of June 1935, which permitted Hitler to build a small

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[32] *Ibid.*, 15–17.

[33] Downs and Rocke, *Tacit Bargaining*, 107–45; A. Chayes, and A. Chayes, *The New Sovereignty: Compliance with International Regulatory Agreements* (Cambridge MA, 1995), 135–73.

[34] Maiolo, *Royal Navy*, 16, 150.

[35] As reviewers have pointed out, Shane J. Maddock's argument about US policy and the non-proliferation regime in *Nuclear Apartheid: The Quest for American Atomic Supremacy From World War II to the Present* (Chapel Hill NC, 2010) is applicable to the Soviet Union as well.

[36] Colin S. Gray, *House of Cards: Why Arms Control Must Fail* (New York, 1992).

fleet, is less puzzling than previous scholars have argued. The agreement was one key part of Britain's elaborate effort to control the rate and character of world naval growth. German adherence to qualitative limitation committed Berlin to build an orthodox fleet, and prevented Hitler's admirals from embarking on a revolutionary warship strategy premised on cruiser warfare, which British planners feared they would. The precedent for it existed. In the late 1920s, while the size of the German fleet was still governed by the Treaty of Versailles, German naval planners had developed the 10,000-ton/11-inch-gun pocket battleship, which was faster than more heavily armed ships and more heavily armed than faster ships. Revolutionary designs such as the German pocket battleships were ideal for disrupting British overseas trade and they prompted the other naval powers to adopt equally unorthodox battlecruiser designs to counter them. Rapid revolutions in warship design were not in Britain's interest. In June 1935, the Admiralty was not moved by Hitler's offer to fix the size of his navy with a tonnage ratio of 35 per cent the size of the Royal Navy, but instead by the German pledge to adhere to *qualitative* limitation as agreed to by the powers in the new naval treaty. In other words, the Anglo-German naval agreement was a diplomatic gambit calculated to commit Germany to following a long-term pattern of naval development that was the least dangerous and disruptive.[37]

For the British persuading Washington to accept their plan proved more difficult than dealing with Berlin, at least until the Japanese Navy's intransigence forced the two English-speaking powers to adopt a common position. The Admiralty wanted a reduction in the size of battleships to 25,000 tons because smaller battleships were cheaper to construct and easier to maintain. US naval planners, however, refused to accept a limit below 35,000 tons because their battleships needed the endurance to win a fleet action against the Japanese Navy after a 7,000-mile transit across the Pacific. The US Navy's General Board also refused to discard the tonnage ratios because they (correctly) suspected that the Royal Navy planned to surpass them in naval strength. Domestic politics also played a role. The US General Board valued the tonnage ratios because the argument that the navy needed to build-up to treaty strength at least had some traction in Congress.[38] Luckily for the US Navy, President Franklin D. Roosevelt had been Woodrow Wilson's assistant secretary for the navy and was a big-navy man at heart. He earmarked job-creation funds from his New Deal to build auxiliary warships in order to keep the shipyards working. In 1934 he also backed the Vinson-Trammell Navy Act that committed the government to raise the navy up to treaty strength and to replace overage ships. These 'follow-on' orders sustained the shipyards until the big battleship and aircraft carrier orders arrived in 1937. In the new naval treaty, Roosevelt did not want to abandon the tonnage ratios as the British proposed, because that would appear to be lifting the cap on naval arms expansion at a time when he was advocating fixing the size of armies and air forces in Europe. However,

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[37] Maiolo, *Royal Navy*, 19–37, 63–86.
[38] Kuehn, 'The US Navy General Board', 1154–9; Stephen E. Pelz, *Race to Pearl Harbor: The Failure of the Second London Naval Conference and the Onset of World War II* (Cambridge MA, 1974), 91–146.

as the second London naval conference neared, and Japan made its demand for tonnage equality clear, American negotiators decided that the British proposal for qualitative limitation alone was better than no limitation at all. President Roosevelt in fact cared little about parity with Britain: he wanted to isolate Japan even if that meant a naval race because leading officials in Washington (and London) were convinced that Japan would soon yield once its leaders realized that they could not outstrip the United States and Britain combined.[39]

The confidence in Washington and London that Japan could be coerced into the naval arms control by the threat of an arms race might have been tempered by a better appreciation of the domestic political imperatives driving Japanese naval policy. In 1921–2, top-ranking officers such as Admiral Kato Tomosaburo had understood that Japan benefited from the Washington ratios, in terms not just of security but also of status. At the same time, other officials, notably the navy's chief of staff Admiral Kato Kanji, had seen the Washington treaties as an act of hegemony by Britain and America to protect their imperial and commercial interests in China and to stop the Japanese empire from growing. Both positions had substance: Japan benefited from the Washington tonnage ratios, but the global political and economic order of the 1920s did in part rest on an Anglo-American condominium at sea. For some Japanese naval officers a 60 per cent tonnage ratio was enough to deter coercion, for others it was a humiliating message from Washington and London asserting the ultimate right of veto on Japan's expansion in China. In the decade after the Washington treaties, these two positions became identified with two factions in the Imperial Navy: the pro-treaty faction in the navy ministry and the anti-treaty fleet faction inspired by Admiral Kato Kanji. Japan's adherence to the 1930 London naval treaty and the extension of the tonnage ratios to cruisers was the last time the treaty faction and the Cabinet could impose their authority on the anti-treaty radicals.[40] The forces released by the Depression and the Japanese Army's conquest of Manchuria from September 1931 undermined Cabinet government. A wave of ultra-nationalist violence peaked in May 1932 when naval cadets murdered the prime minister during a failed coup. Against this background of economic and political upheaval, state power shifted away from civilian politicians towards military-bureaucratic elites. This domestic political change as well as changes inside the navy drove up the demand for naval expansion. In 1933–5, the top posts in the navy ministry and on the naval staff went to officers of the fleet faction. The navy forced the Cabinet to demand nothing less than parity with the US Navy at the upcoming naval conference and to more than double the spending on warship construction. The surge in naval expenditure enabled the Japanese Navy to bring all of the nation's ship-building capacity, including private manufacturers who preferred the steady and less exacting work of civilian to naval shipbuilding, within the navy's control

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[39] Pelz, *Race to Pearl Harbor*, 125–9, 155–6; Memo by Norman H. Davis, 28 April 1934, Box 9, Norman H. Davis Papers, Library of Congress, Washington, USA; *Foreign Relations of the United States* [hereafter FRUS], 1935, I, 144–9, 23 November 1935.

[40] Asada, *From Mahan to Pearl Harbor*, 99–157; Sadao Asada, 'The London Conference and the Tragedy of the Imperial Japanese Navy' in Maurer and Bell, *At the Crossroads*, 89–134.

through a policy of domination through procurement.[41] It also pitted the navy and the army against each other in a policy-distorting rivalry over the allocation of limited industrial resources.[42]

Japanese naval planners grasped how Britain's arms control proposals were intended to constrain Japan's naval growth in ways that sustained the *status quo*. In December 1936 the Japanese delegates therefore asserted two principles that ran counter to what London needed in the new treaty: first, the Japanese proposed that the three leading naval powers should agree a common upper tonnage limit and, second, each should decide how to distribute that tonnage between vessels of *any* size and feature in order to meet their national strategic requirements. The US and British delegations refused to accept the demand from the Japanese for parity in the form of the common upper limit and, as expected, their delegation withdrew from the conference. In March 1936, London, Washington, and Paris agreed to ratify the second London naval treaty, which embodied the British proposals for transparency and standardization in warship building. Italy also agreed to comply with the new treaty, but refused to sign and ratify it until League of Nations sanctions over the invasion of Ethiopia ended. The British Admiralty and the Foreign Office celebrated the naval treaty as a diplomatic triumph that would ensure Britain's place as the world's greatest sea power, and followed it up with a huge burst of naval building to deter rivals. In 1936–7, the Royal Navy laid down five 35,000 tons battleships (more than any other naval power at the time), four aircraft carriers, fourteen cruisers and other vessels.[43] 'The world knows we can [defend our supremacy at sea],' the Admiralty asserted, 'and seeing us make a determined start it may realise the futility of challenging us.'[44] As we know this optimism proved to be very short lived. Britain's great surge of warship building in the second half of the 1930s was an opening move in a burgeoning naval arms race.

PHASE III: THE NAVAL ARMS RACES BEGIN, 1936–1940

From 1936 onwards the arms races in Europe initiated by the Nazi regime for reasons that lay outside the sphere of naval relations between the major maritime powers began to take on wider and deeper proportions, encompassing whole economies and societies mobilizing for total war. As this author has argued elsewhere, Hitler's growing sense that Germany was losing the arms race and that Germany's early rearmament in air and land forces was a wasting asset drove his reckless diplomacy over Czechoslovakia and Poland in 1938–9.[45] While to varying degrees navies benefited from the huge investment in state resources in armaments, the

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[41] Asada, *From Mahan to Pearl Harbor*, 161–206; Yoshiaki Katada, 'Towards the Dismantling of Japan's Military Industrial Complex: The Navy and the Economy in the 1930s', *NUCB Journal of Economics and Information Science* (2005), 21–34.

[42] Michael Barnhart, *Japan Prepares for Total War: The Search for Economic Security, 1918–1941* (New York, 1987), 91–114, 136–75.

[43] David Edgerton, *Warfare State: Britain, 1920–1970* (Cambridge, 2005), 26–33.

[44] Maiolo, *Cry Havoc*, 130.   [45] *Ibid.*, 211–369.

dynamics of naval rivalry did not bear directly on the decisions for war. Given the long cycle of planning, construction, and training required to operate major warships, admirals the world over tended to think in terms of decades of peacetime naval expansion to realize their master plans and agonized at the thought of an unexpected war disrupting them.

The British Admiralty premised its master plan on peace in Europe until at least the mid-1940s. That was one reason why the head of the British chiefs of staff, Admiral Sir Ernle Chatfield, backed Prime Minister Neville Chamberlain's policy of appeasement towards Berlin in 1937–8. Britain's effort to prop up the international system through Anglo-German detente was linked to a diplomatic drive to extend naval arms control to the powers that had not signed the 1936 London naval treaty. In 1936–7 Washington and London attempted to cajole and to coerce Tokyo into compliance. The British sought to keep Germany compliant by bringing the Soviet Union and the Baltic states into the arms control regime. On the surface, this elaborate diplomatic effort was successful. In July 1937 Germany and the Soviet Union agreed to adhere to the London treaty's rules promoting transparency in naval construction programmes and the standardization of warship design by categories. In 1938 the Scandinavian countries concluded a similar agreement to ensure that their naval building did not upset the precarious warship balance brokered by London between Berlin and Moscow.[46]

However, the British attempt to stem the revisionist tide in international politics driven by Germany was bound to fail. The Nazi regime's challenge to the post-1919 order not only energized the internal and competitive external arms dynamics of all the great powers in an escalating cycle of action and reaction, but it also propelled a revolt against the order of sea power that had been enshrined in the Washington and London naval treaties. The language within which the grand naval ambitions of the revisionist powers were framed underscores the close connection between competitive arming at sea and the larger political trends in international relations. The anti-treaty militants of the Japanese Navy spoke of breaking the 'fetters' of Anglo-American hegemony at sea and of excising the 'cancer' of the Washington naval treaty. Admiral Domenico Cavagnari, the head of the Italian Navy, used similar terms to bolster his service's place within the fascist state: 'Britain has revealed itself to be opposed to all our imperial aspirations in principle,' he informed Mussolini in 1935, 'if we accept that our destiny will take us into a confrontation with Britain, then there is the inescapable need to strengthen our Navy.'[47] This inherently ideological dimension to the naval arms race after

[46] Gerard Silverlock, 'British Disarmament Policy and the Rome Naval Conference, 1924', *War in History* x (2003), 184–205; Joseph A. Maiolo, 'Naval Armaments Diplomacy in Northern Waters: The Origins of the Anglo-Scandinavian Naval Agreement of 21 December 1938', in Rolf Hobson and Tom Kristiansen, eds., *Navies in Northern Waters, 1721–2000* (London, 2004), 191–208; Joseph A. Maiolo, 'Anglo-Soviet Naval Armaments Diplomacy before the Second World War', *English Historical Review* 123/501 (2008), 351–78.

[47] Asada, *From Mahan to Pearl Harbor*, 192–4; Robert Mallett, *The Italian Navy and Fascist Expansionism, 1935–40* (London: Frank Cass, 1998), 50–1; Admiral D. Cavagnari, 'Considerazioni circa la Necessità di Aumentare la Flotta', b.2684, Ufficio Storico della Marina Militare, Rome, Italy [hereafter USMM].

1936 is best illustrated by the manner in which the German naval staff justified first cheating on and then denouncing the June 1935 and July 1937 Anglo-German naval agreements: '[Germany has] no interest in supporting the present system of naval agreements which has at the best no other purpose than to stabilize for all times, on all seas, and with the employment of the least resources possible the British superiority at sea.'[48]

The ideological link between naval building and a rebellion against the prevailing maritime order was not limited to the admirals of the Axis states. The elite of the French Navy, which was dominated by anti-republican conservatives, also saw their efforts to attain France's proper place among the colonial and maritime powers as a struggle against Anglo-American hegemony. The French naval staff regarded naval arms control as a British ploy for the containment of France. In the 1920s they had opposed the abolition of that quintessential anti-British weapon, the submarine, and at the Geneva disarmament talks had pioneered the subversive doctrine of a common upper tonnage limit for the naval powers that could be distributed on ships of any size or type according to national needs. In 1933, the French Navy's chief of staff, Admiral Georges E. Durand-Viel, decried the 'British obsession with reducing the French fleet' and denounced the British exploitation of ongoing naval arms control talks 'to maintain at the least possible expense, [Britain's] dominance in European waters'.[49] Of course French admirals alone did not have the political clout to make a drive to overturn the naval treaties the goal of French national policy. French victory in a long war against German air-land attack was too closely tied to British and American assistance for policy-makers to accept that line. In any case, inside the French Navy strategic realities triumphed over ideological impulses and an identity constructed on opposition to the Washington treaty system. Moreover, while the French Navy enjoyed more than its fair cut of national resources in the 1920s, its share shrank during the 1930s relative to the army and air force owing to the rise of the German menace. In January 1938, French naval planners accepted that they would be runners up in the developing naval race and they recognized that they needed the Royal Navy as an ally to counterbalance the expanding German and Italian fleets.[50]

One danger of arms control is that one party to a treaty might use it as camouflage to steal an advantage over signatories who adhere to it. As theory predicts and the demise of the inter-war naval treaties bears out, the incentive to cheat rises as war nears.[51] British and American naval officers knew that rivals might cheat on *tonnage limits* (which could not be easily determined by observation) in order to build better-protected ships and, more ambitiously, to use the treaties as cover for a technical leap in ship design. Cheating by the other powers never troubled the British, who felt that their superior seamanship and naval engineering would always prevail. Even when evidence of Italian and German cheating on tonnage limits came to light in 1936–7, the Admiralty judged that the long-term benefits

[48] Maiolo, *Royal Navy*, 157.
[49] Peter Jackson, 'Naval Policy and National Strategy in France, 1933–1937', *Journal of Strategic Studies* 23/4 (2000), 130–59.
[50] *Ibid.*, 145–52.   [51] Downs and Rocke, *Tacit Bargaining*, 22–4, 190–2, 166–9.

Britain obtained from naval arms control out-weighed any short-term advantage that might be gained by a diplomatic protest.[52] British and American naval intelligence services assumed that Tokyo would exploit its defection from the treaty system to build ships of 45,000 tons carrying 16-inch guns, but this premise underrated the Japanese Navy's ambitions. To counter any attempt by the United States or Britain to win a fleet engagement in the Pacific, Japanese naval planners had originally imagined building ships of 50,000 tons carrying 20-inch guns, but in the summer of 1936 the naval architects came up with a better balanced yet gargantuan design for a 70,000-ton vessel armed with 18-inch guns. Work began in November 1937 and March 1938 on the first two of what were meant to be four of these *Yamato* class super-battleships. What is most striking about this expression in steel of the Japanese Navy's desire to remake the global order of sea power was that it was *entirely orthodox in conception*. The Japanese imagined that the next naval war would be fought between fleets of big-gun capital ships and that their *Yamato* class battleships represented a leap in the navy's strength in a single 'bound' from inferiority against the US Navy to 'absolute superiority'.[53] Of course the epic carrier battles of the Pacific War would demonstrate otherwise. It is common to dismiss the Japanese Navy's super-battleship strategy (indeed the attachment of navies generally to the big-gun ships) as indicative of an organizational culture resistant to technical and doctrinal innovation.[54] Yet that argument is often over-stated because it underestimates how powerful the shared construct of the battleship as the ultimate symbol of national power and prestige had become by the inter-war years. Navies and nations wanted to build battleships because they had become the common currency of international rivalry at sea.[55]

Germany also adopted an orthodox challenge to Britain's sea supremacy based on large surface vessels rather than cheaper asymmetric alternatives suitable for a continental great power such as U-boats.[56] In 1935 Admiral Erich Raeder, the head of the German Navy, accepted Hitler's plan to limit the size of the German Navy to 35 per cent that of the Royal Navy because that deal gave him plenty of scope until 1940 to build a small battleship fleet until the time was ripe for a direct challenge to Britain's naval supremacy.[57] In 1937–8 Raeder exploited rising

[52] Joseph A. Maiolo, ' "I believe the Hun is cheating": British Admiralty Technical Intelligence and the German Navy, 1936–39', *Intelligence & National Security* 11/1 (1996), 32–58.

[53] Malcolm Muir, 'Rearming in a Vacuum: United States Navy Intelligence and the Japanese Capital Ship Threat, 1936–45', *Journal of Military History* 54/4 (1990), 473–85; Evans and Mark R. Peattie, *Kaigun*, 370–83; Sadao Asada, 'The Japanese Navy and the United States', in Dorothy Borg and Shumpei Okamoto, eds., *Pearl Harbor as History* (New York, 1973), 225–59.

[54] For a sophisticated application of this approach see Geoffrey Till, 'Adopting the Aircraft Carrier: The British, American and Japanese Case Studies', in Alan R. Millett, and Williamson Murray, eds., *Military Innovation in the Interwar Period* (Cambridge, 1996), 191–226.

[55] Buzan and Herring, *The Arms Dynamic in World Politics*, 179–98.

[56] One reason why the German Navy did not invest heavily in the U-boat arm before the outbreak of the war was that it fell victim to a long-running British deception campaign to convince the world's navies that the Royal Navy had 'solved' the U-boat threat to its maritime trade with the invention of sonar. See Joseph A. Maiolo, 'Deception and Intelligence Failure: Anglo-German Preparations for U-boat Warfare in the 1930s', *Journal of Strategic Studies* 22/4 (1999), 55–76.

[57] Michael Salewski, 'Marineleitung und politische Führung, 1931–1935', *Militärgeschichtliche Mitteilungen* 10 (1971), 113–58.

Anglo-German antagonism to influence the dictator in a way that illustrates how narrow service interests and rapid changes in threat perception can interact to skew national arms-acquisition decisions. As Hitler fumed at British diplomatic efforts to curtail his aggressive plans in Europe, he vented his frustration in demands that the growth of the fleet be sped up. As a result Raeder obtained a growing share of scarce raw materials and skilled labour for the navy. In May 1938, the navy accelerated U-boat assembly, investigated installing larger guns on its two 30,000-ton battlecruisers, and considered building six new slipways for one big burst of battleship building. In the summer of 1938, German naval planners studied how to defeat Britain. They came up with two different building schemes and strategies. The first was to build a fleet of large long-range U-boats, large 8-inch-gun cruisers, and 19,000-ton pocket battleships, all intended to evade the Royal Navy and cut Britain's overseas lifelines. The other plan called for a core of super-battleships that would be capable of winning a fleet action against the French Navy or, in favourable circumstances, the British. Admiral Raeder, who had studied the disruptive impact of German surface raiders on British trade in 1914–18, favoured prioritising the construction of submarines, heavy cruisers, and pocket battleships. According to his planners, given the capacity of Germany's shipyards and the availability of raw materials and skilled workers, these vessels could be ready for commerce warfare against the British Empire by 1943. In November 1938, only weeks after Hitler and Chamberlain concluded the Anglo-German accord at Munich, Admiral Raeder met with Hitler to discuss warship building. Perhaps regretting that he had cramped German warship building with the 1935 and 1937 naval treaties, Hitler berated his top admiral for the navy's inferiority. Raeder and his staff responded to this rebuke by offering the dictator the even more ambitious anti-British Z-Plan, according to which Germany would build over ten years six 60,000-ton/16-inch-gun battleships, twelve 19,000-ton pocket battleships, twenty-four heavy 8-inch-gun cruisers, and over 200 U-boats. On 27 January 1939, only eight months before the outbreak of war on the Continent, Hitler ordered that the Z-Plan be given absolute priority in resources over army and air-force expansion.[58]

One of the problems with the Z-Plan, like all the German plans to win the various arms races, was that it assumed Britain would be idle while Germany sped ahead. Admiral Raeder also seems to have been under the delusion that the immense resources required to build the Z-Plan fleet, and to maintain it, would be made available, and that a long period of peace would follow the Munich Conference of September 1938 to allow time him to build it. Perhaps hedging his bets, and by doing so revealing some unease about those assumptions, Raeder tried to coordinate his ship-building and war plans with the Italian Navy against their common Anglo-French foes.[59] Unfortunately for the Germans, the Italian Navy's

[58] Dülffer, *Weimar, Hitler, und die Marine*, 370–555; Michael Salewski, *Die deutsche Seekriegsleitung 1935–45: Band I 1935–41* (Frankfurt, 1970), 20–90.

[59] Report of a conversation between the Italian naval attaché Berlin, Captain C. P. Giraldi, with Admiral Raeder, 23 February 1939, Gabinetto, b. 88, f. Germania, No. 358, Ministero della Marina, Archivio Centrale dello Stato, Rome [hereafter ACS].

ideal plan for staying in the naval arms race in the Mediterranean was as unrealistic in timescale, political assumptions, and available resources as Germany's Z-Plan. Drafted over the winter of 1935–6, while the London naval conference met, the plan called for the construction of an 'evasion fleet' strong enough to control the Mediterranean and to venture into the Atlantic and Indian oceans. It consisted of nine battleships, three aircraft carriers, thirty-six cruisers, and eighty-four submarines, or two-thirds the size of the Royal Navy. At Italy's current rate of shipbuilding, the naval staff estimated the last units would leave the slipways in the late 1950s. To build the 'evasion fleet' in six years would thus require a huge expansion in shipyard capacity. Even if the resources were available, Italy lacked the bases outside the Mediterranean to support an ocean-going force, and Britain and France would build extra tonnage to counter it anyway. The Italian naval staff probably only dreamed up the idea in order to play on Mussolini's appetite for more ships in order to gain a larger share of national resources for the navy as inter-service rivalries intensified, but even the *Duce* concluded that building the evasion fleet was unrealistic.[60] As the naval arms race began to take on momentum, Italian naval planners became far less ambitious. By 1939, they concluded that Germany and Italy combined could maintain a 41 per cent naval ratio against the combined tonnage of Britain and France.[61]

Moscow's strategy for the naval race was similar to that of the other naval revisionists. Stalin and his warship planners calculated that Japan's refusal to sign the 1936 London naval treaty meant that Soviet adherence to the Anglo-Soviet naval agreement of July 1937 was an empty gesture. The bastion of world communism after all had little interest in an arms control regime designed to prolong the sea supremacy of the world's leading capitalist-imperialist power. So long as the naval treaty system was in place, though, it would act as cover for a burst of fleet building. Stalin's naval planners hoped to construct by the mid-1940s a formidable navy of twenty battleships, ten pocket battleships, two aircraft carriers, and hundreds of auxiliaries. The design features of Russia's capital ships and other vessels ignored the qualitative restrictions contained in the 1936 London naval treaty. The chief obstacle to the Soviet Union building the fleet was a lack of engineering expertise. Russia needed a huge transfer of naval technology to make up for the years of learning about naval engineering and construction lost as a result of the revolution and the civil war. In the naval sphere, the Soviet Union was thus in a position similar to that of the Chinese Navy today, one of arms 'chasing' rather than racing (see Tai Ming Cheung's chapter in this volume[62]). In the 1920s and the early 1930s, Italy, Germany, and France sold naval technology (and in Rome's case whole ships) to Russia, but Britain refused. When in March 1936 Britain invited the

[60] John Gooch, *Mussolini and his Generals: The Armed Forces and Fascist Foreign Policy, 1922–1940* (Cambridge, 2007), 342–3, 345–50, 404–6; 'Studi Sul Programma Navale', 13 January 1936, b. 295, Ministero della Marina, ACS; Fortunato Minniti, 'Il problema degli armamenti nella preparazione militare italiana, 1935–1943', *Storia Contemporanea* 9/1 (1978), 5–61.

[61] 'Pro-memoria sul Programma anno XVII e seguenti', January 1939, DC/O-A, b.1, f.1, USMM.

[62] See Tai Ming Cheung, 'Racing from Behind: China and the Dynamics of Arms Chases and Races in East Asia in the Twenty-First Century' in this volume.

Soviet Union to comply with the naval treaties, the Russians had the leverage they
needed to obtain British technology. As soon as Anglo-Soviet naval talks began in
London, the Soviet trade delegation to Britain approached all the major naval
technology firms with orders and request for technical aid: the Russians left no
doubt that the price of their cooperation would be help with catching up in naval
technology. Admiralty planners understood what the Russians wanted and expressed
their contempt: 'It is perfectly clear,' wrote one official, 'that the real object [of
seeking British assistance] is to establish an up-to-date naval shipbuilding industry
in Russia with the least possible delay and that they intend if they can to pick our
brains in so doing.'[63] In any case, the complex Anglo-Soviet talks resulted in a tacit
deal whereby the British would exchange select technology (for instance a 6-inch-
gun-turret design for heavy cruisers) that would ensure that the Russians conformed
to the 1936 London treaty. Not surprisingly, Soviet officials complained bitterly
that the Admiralty was carefully rationing what they could buy on the market from
British firms and they correctly concluded that what was being sold to them was
second rate equipment.[64]

Ultimately, the Soviets' calculation that Japan's refusal to adhere to the qualita-
tive limits of the 1936 London naval treaty would free them from their promise to
conform proved to be correct. In March 1938 the signatories to the London naval
treaty—Britain, the United States, and France—invoked the treaty's escalator
clause, which allowed them to respond to Japan's secret building by raising the
qualitative limits for capital ships to 45,000 tons and 16-inch guns. The naval race
had now reached the stage at which the British naval staff could no longer be con-
fident that the Royal Navy could stay ahead of the pack. Admiralty studies of the
financial and technical implications of building battleships of the maximum size
and firepower concluded that they were too big and too expensive for the Royal
Navy to build and maintain without a huge outlay on dockyards and other facil-
ities. Admiralty officials also acknowledged that building up the air force and the
army against Germany had rendered their case for a vast increase in the naval
budget unconvincing. The Royal Navy's reaction to Japan therefore was a three
year programme (1938–40) of six 40,000-ton capital ships armed with nine 16-inch
guns. In a desperate bid to hold the line in Europe, the British issued a 'self-denying
ordnance' that they would only build ships of 40,000 tons, in the unrealistic hope
that the other European powers would follow suit. The Russian and the German
navies already had ships building or planned that exceeded that limit. During 1938
the Germans decided to denounce the naval treaties because the scale of their war-
ship building would soon become apparent. In December 1938, Berlin informed
London that it would build up its U-boat force to parity with the British sub-
marine fleet and that it would break a pledge to arm two new 10,000-ton cruisers
with 8-inch instead of 6-inch guns (as the German naval staff had always planned).
In April 1939, Hitler took the final step and denounced the Anglo-German naval

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[63] Maiolo, 'Anglo-Soviet Naval Armaments', 357–66.
[64] Maiolo, 'Anglo-Soviet Naval Armaments', 366–77; M. Muir, 'American Warship Construction
for Stalin's Navy Prior to World War II: A Study in Paralysis of Policy', *Diplomatic History* 5 (1981),
337–51.

agreement of 1935 as well as the exchange of information protocol in the naval agreement of July 1937.[65]

When war in Europe broke out in September 1939, Britain abandoned the naval treaty system altogether. As one senior British naval officer wrote, the naval balance would no longer be determined by peacetime arms competition or the naval treaties, but instead by the verdict of battle. The Royal Navy, he argued, had to achieve a two-power standard by destroying the German surface fleet quickly before Italy and Japan joined the conflict and overstretched Britain's resources.[66] Lamenting that the outbreak of war over Poland had wrecked the Z-Plan, Admiral Raeder concluded that all that was left to his sailors was to show that they knew 'how to die gallantly'.[67] Germany and the other European powers abandoned most of their big-ship-building plans as the war unfolded. Meanwhile, Japan's refusal to comply with the naval treaty and the coming of war in Europe accelerated American naval growth. In a winning move that no other naval power could match, President Roosevelt's Two-Ocean Navy Act of July 1940 authorized a vaulting 70 per cent rise in the US Navy's total combat tonnage.[68]

CONCLUSION

In this chapter's analysis of inter-war naval competition, the spur of technological change, the action-reaction model, and domestic industrial-political imperatives have all featured at different times in varying intensity. Yet even together these three explanatory models are insufficient to account for the course and outcome of competitive naval building between the two world wars if applied in isolation from the large trends in world politics. The interval between the Washington and first London naval treaty was a period of relative international stability and the politics of naval armaments was dominated by status quo powers; from the early 1930s great power relations broke down and a new intense phase of international competition began for reasons that lay beyond the scope of relations between the major naval powers. The budding post-1919 naval race between the three largest naval powers began as an action and reaction cycle in response to perceived external threats but ended in naval arms control in large measure because the domestic drivers behind the race were weak and US naval and political goals were limited. By the mid-1930s, the stage was set for a resumption of naval rivalry, particularly in capital ships, as Britain, the United States and Japan, France, Italy, Germany, and Russia all began to modernize, rebuild, and expand their fleets. The British attempt to use naval arms control to slow the pace and scale of this naval growth illustrates the

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[65] Maiolo, *Royal Navy*, 163–71, 176–85.
[66] Admiralty to Foreign Office, 24/28 August 1939, MO8132/39, The National Archives, Kew, UK [hereafter TNA] ADM[iralty]1/10524, TNA; Head of Plans Division, 20 September 1939, PD07981/39, TNA ADM1/9899.
[67] Salewski, *Die deutsche Seekriegsleitung, i,* p. 91.
[68] Dean C. Allard, 'Naval Rearmament, 1939–41: An American Perspective', *Revue Internationale d'Histoire Militaire* 73 (1991), 35–50.

interrelatedness of arm control and arms racing. For London naval diplomacy was a vital instrument to perpetuate the Royal Navy's supremacy. What was striking about British naval diplomacy was that its emphasis on transparency and the exchange of information about naval building programmes conforms to the findings in the theoretical literature about the importance of reassurance about the future military balance to successful arms control and the prevention of arms races. The challenge of the revisionist powers likewise shows the way in which competitors can exploit a collapsing arms control regime to steal a march on their foes. Even so, the 'big ship' admirals of the revisionist states drew up unrealistic building plans inflated by the arms spending bonanza of the final pre-war phase of reciprocal arming and alliance building. These plans and naval arms races generally were peripheral to the decisions that led to the outbreak of war in Europe and the Asia–Pacific region. Indeed, naval planners everywhere except in Washington would have preferred a few more years of peacetime naval expansion rather than having their grand plans for huge fleets scrapped by the coming of Second World War.

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Aircraft and the Arms Race Between the World Wars

Richard Overy

The advent of the aeroplane as an instrument of war added new dimensions to the history of arms racing in the twentieth century. Aircraft were used for serious military purposes—reconnaissance, artillery spotting, bombing, fighter interception—from the first year of the Great War and initiated a wartime race to stay abreast of current developments in aircraft design, aerial weapons, and aero-engine technology. Because early aircraft were relatively unsophisticated pieces of equipment, they could be produced in large quantities by all the major combatant powers. But the generation of aircraft that emerged in 1917–18 was remarkably different from the first models that had entered service four years before. Because aviation was an infant service, with a technology in the process of rapid and unstable transition, the experience of war propelled the competitive development of doctrine and technology. In the post-war world, the place of military aviation was uncertain and the terms of aviation competition still to be defined.

In the first fifteen years after the end of the Great War military aviation became one of the principal targets of international initiatives for disarmament. This was not simply in order to reduce or control the risk of future conflict, but also because aircraft, unlike ships or armies, could attack the enemy home front directly, and do so with the possibility of unleashing new forms of chemical or biological warfare. The 1920s saw an upsurge of popular anxiety about the probable effects of heavy air attack directed at civilian populations, and a corresponding effort to limit or even to abolish the possibility of such a catastrophe. In 1923 a committee of international jurists met at The Hague, following an initiative agreed at the 1921–2 Washington naval disarmament conference, for the purpose of defining in international law what was acceptable in the military use of aircraft. The jurists recommended, in the so-called Hague Rules, limiting military aviation to front-line operations only, and defined as illegal any deliberate attack on objectives in which civilian lives and property would evidently be destroyed. The Rules were not ratified by any of the participating parties but were widely regarded thereafter as representing a legal consensus on what was an acceptable use of military air power. Two years later, in a treaty agreed at Geneva, the use of gas and biological weapons was outlawed. This was ratified by most major states (the United States only in 1972), in the hope that

the worst of the popular fantasies about air attack on civilian populations could be made impossible.[1]

Aircraft and airborne armaments were singled out for special treatment in the disarmament campaign as a result of the threat they posed. Unlike the efforts to control the number and size of naval vessels, in which some solid progress was made, proposals for military aviation advocated complete international control over all forms of aviation, or the abolition of all military aircraft, or the outlawing of offensive aircraft, principally bombers. A subsidiary proposal involved the establishment of an aerial police force under international control, which would be used to enforce wider disarmament requirements and, under certain circumstances, to curtail aggression. These suggestions were all raised and discussed at the Geneva Disarmament Conference in 1932–4, principally by the French in the so-called Tardieu Plan and then in March 1933 by the British delegation, which recommended abolishing bombing as a means of war and limiting the number of aircraft held by each state, from 500 for Britain down to twenty-five for Portugal (and none for Germany, under the Versailles Treaty terms).[2]

Each or any of these propositions would have brought to an end the evolution of military aviation and, by implication, any attempt to embark on an arms race in the air, except by covert means. The problem in this case, as with most disarmament proposals, was to try to create a verification regime that would ensure that military aviation was not being sustained by some backstairs artifice; or to find an international institutional structure—which could be trusted by all participants—to operate civil or military aircraft, or to be certain that in the event of war civilian aircraft would not simply be converted into bombers. The effort to set clear and restrictive limits on the development of national air power foundered in the end, however, not on the problems of verification or enforcement, but on the reluctance of the British government and the RAF to relinquish the possibility of using bomb-carrying aircraft to carry out policing operations in what were coyly called 'outlying regions', but in effect imperial territory. Since the other delegates at Geneva could see that this would mean one law for the British Empire and one law for the rest, the proposal lapsed, not to be revived again before the outbreak of war.[3] This failure was predictable enough in the circumstances, since no air force wanted voluntarily to abandon its *raison d'être*, but it also enabled the German delegation, now representing the Hitler government, to argue that in the absence of international agreement on air disarmament, air rearmament was an unavoidable corollary. The consequence was the onset of limited German air rearmament,

[1] Joel Hayward, 'Air Power, Ethics and Civilian Immunity during the First World War and its Aftermath', *Global War Studies* 7 (2010), 127–8; Heinz Hanke, *Luftkrieg und Zivilbevölkerung* (Frankfurt am Main, 1991), 71–7.

[2] Philip Meilinger, 'Clipping the Bomber's Wings: The Geneva Disarmament Conference and the Royal Air Force, 1932–1934', *War in History* 6 (1999), 311–21; Thomas Davies, 'France and the World Disarmament Conference of 1932–1934', *Diplomacy & Statecraft* 15 (2004), 772–3; Waqar Zaidi, '"Aviation Will Either Destroy or Save our Civilization": Proposals for International Control of Aviation, 1920–45', *Journal of Contemporary History* 46 (2011), 155–9.

[3] Carolyn Kitching, *Britain and the Geneva Disarmament Conference: A Study in International History* (Basingstoke, 2003), 59–60, 124–5.

and, within the next five years, a competitive arms race in the air between the major states, each worried that the others might gain an advantage in the air that would weaken its strategic position. The race turned small air forces numbering a few hundred conventional front-line aircraft into large-scale air services controlling thousands of aircraft, many of which were at the cutting edge of aviation technology.

The arms race in the air that developed in the 1930s, principally though not entirely in Europe, was driven by a number of distinct imperatives which made it almost impossible to reverse or limit the race once it was under way. It is possible to identify four principal factors that helped to define the nature of that race: the challenge air power represented to existing security concepts; the need to ensure technological parity and to avoid force obsolescence; the choices made in air doctrine (air–ground, air–sea, combined operations, air defence, strategic bombing); and intelligence perceptions of potential enemies and their strength in the air. Each of these will be examined in turn, though they should not be regarded as mutually exclusive. There existed an evident synergy between all four of these elements in creating the circumstances that prompted the aerial race.

THE CHALLENGE TO EXISTING CONCEPTS OF SECURITY

The British Conservative Party leader Stanley Baldwin, in a famous speech to the House of Commons on 10 November 1932, claimed that any town within range of an enemy air base could be the object of attack in future war.[4] The flexibility and striking power of aircraft opened up a whole range of new security issues. Some of them, as with Baldwin's additional claim that 'the bomber will always get through', were exaggerated in order to highlight the urgent need for disarmament, but there is no doubt that aircraft used to attack distant targets in an enemy state, whether military or civilian, posed a novel threat and altered the way in which security in the 1930s came to be configured.

For states used to the protection of geography, principally Britain and the United States, but also including Japan, security had been based on naval power. Aircraft undermined that immunity because not only could they be used to destroy or sink capital ships and other vessels (a claim that was still widely contested, even in 1939) but also they could avoid the naval shield altogether by simply flying across it. The peculiar threat posed by aircraft explains why in the 1930s British security was seen no longer to lie in the chimera of aerial disarmament, but in the possibility of building up a sufficient striking power to encourage mutual deterrence or a sufficient aerial defence to blunt the enemy's strategic air power. For the major European states, aircraft posed the same threat of long-range destruction from the air, but more critically it was expected that air power would be used in conjunction with ground forces to provide a defensive shield over an advancing

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[4] Parliamentary Debates (*Hansard*), Ser. 5, vol. 270, column 632, 10 November 1932.

force, while simultaneously destroying the defensive shield of the enemy. Once French hopes for air disarmament had been dashed in 1932, the French Army supported the expansion of the French air arm only to the extent that it could be integrated with the army's defensive strategy rather than used in any more independent role. No air deterrent or striking force was thought to be necessary as long as French mobilization and deployment could be protected. When the air arm tried to develop a core of strategic air units in 1936/7, the plan was stifled and by the outbreak of war more than four-fifths of all aircraft were allocated in small numbers to each army corps.[5]

Any failure to anticipate the growth of a potential enemy's air power and to adjust air power resources to compete with it was widely understood in political and military circles to be a critical risk to security. German air rearmament, which began seriously in 1934 and was formally announced a year later, was not only based on the expectation that aircraft would be an essential adjunct in any future ground war, but also intended to offer Germany greater security against the possible threat of a circle of hostile air forces capable of bombing much of German territory (the solution that Roosevelt later recommended to his Cabinet in the wake of the Munich conference in September 1938).[6] British air rearmament was predicated on two security assumptions: first, that a striking force of bombers would act as a deterrent against any threat (though the German threat was paramount, the RAF had also considered a possible 'Locarno' war against France in the late 1920s in case France violated the 1926 agreement and again sent an army into Germany, as in the 1923 occupation of the Ruhr);[7] second, that an air defence system based on anti-aircraft guns, fighter aircraft, and effective observation (later radar), would be able to deflect the full weight of an enemy bombing attack if deterrence failed. These were potentially incompatible strategic aims, and both Germany and Britain during the war had to find ways of justifying the pursuit of both ambitions simultaneously.

For Britain and France, aircraft also played a part in calculations of imperial security since aircraft promised a rapid and flexible means to cope with local crises. The British practice of imperial 'air policing' was established early in the 1920s and continued with little interruption down to 1939.[8] The defence of empire against external enemies was also a feature of British air planning. In the mid-1930s, the RAF search for an 'Ideal Bomber' focused on an aircraft that could undertake long-range bombing of targets in Japan or the Soviet Union, and offer 'Empire

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[5] Robin Higham, *Two Roads to War: The French and British Air Arms from Versailles to Dunkirk* (Annapolis MD, 2012), 121, 132–3.

[6] Harold Ickes, *The Secret Diary of Harold L. Ickes* (London, 1955), 468–9.

[7] The National Archives, Kew, UK [hereafter TNA] AIR [Ministry papers] 9/8, Notes on a possible 'Locarno War', 2 May 1929. On the vexed relations between Britain and France over air power in the 1920s see Andrew Barros, 'Razing Babel and the Problems of Constructing Peace: France, Great Britain, and Air Power, 1916–1928', *English Historical Review* 126 (2011), 103–10.

[8] Sebastian Ritchie, *The RAF, Small Wars and Insurgencies in the Middle East, 1919–1939* (Northolt, 2011); Priya Satia, 'The Defense of Inhumanity: Air Control and the British Idea of Arabia' *American Historical Review* 111 (2006), 16–51.

reinforcement' across the globe.[9] 'Russian progress,' wrote the Plans department in the Air Ministry in 1936, 'as forecast for the next say ten years, must entirely alter our conception of the problem of the defence of India.'[10] In 1938, anticipating the future Cold War, the RAF assumed that bombers from the Soviet Union would not only menace interests in India and the Middle East, but would also threaten British cities. The threat could only be met, so it was suggested, by preparing a bomber strike force against the Soviet Union.[11] Until Stalin's decision in 1937 to close down the Soviet long-range bomber programme, the Soviet armed forces had indeed considered the possibility of using air power for long-range strikes against imperialist enemies.

Air power changed a great many security assumptions and drove on the search that led to the intercontinental bombers of the late 1940s and 1950s. In the United States, thinking in the Army Air Corps from at least the mid-1930s focused on the belief that at some stage the United States might require bomber aircraft capable of mounting operations across the ocean, rather than simply defending the approaches to the continental United States. In 1935, Colonel Carl Spaatz (the later wartime supreme commander of American air forces in Europe), commenting on the current doctrine of the Army Air Corps, argued that rapid changes in air technology meant that the United States would have to develop a very-long-range bomber to protect interests in the Pacific, and to be able to project air power across the Atlantic from American bases: 'It would appear,' wrote Spaatz, 'that the same reasons which dictated the necessity for long cruising ranges in the development of our sea-power now demand a similar development in our air power.'[12] The War Plans Division in 1937 warned that although 'a powerful coalition against us is at present highly improbable', it would be wrong to be complacent 'in view of the present unsettled state of the world, the increase in armaments, and the rapid development of aviation'.[13] By the late 1930s Air Corps leaders were convinced that hostile air forces would be capable of mounting air operations against the United States in the very near future and that American security required the development of aircraft with sufficient range and striking power to reach Europe. On 10 May 1940, the very day that Germany invaded the Low Countries and France, Major General Henry Arnold, commander of the Air Corps, called for the development of a bomber with a 4,000-mile radius of action, capable of disrupting at source any attempt to send an expeditionary force from Europe against the United States.[14] From a

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[9] TNA, AIR 9/8, Air Staff memorandum, 15 January 1936, 2–3, 5.

[10] TNA, AIR 9/8, Air Ministry Plans to Deputy Chief of the Air Staff, 24 September 1936, 1.

[11] TNA, AIR 9/77, Operational Requirements Committee, minutes of meeting 11 August 1938, 4.

[12] Library of Congress, Washington D.C. [hereafter LC], Andrews papers, Box 11, memorandum for the executive, 'Comments on Doctrine of the Army Air Corps', 5 January 1935.

[13] LC, Andrews papers, Box 10, memorandum for the Secretary of War from Major General Oscar Westover, Air Corps C-in-C, 24 November 1937, citing WPD report 3 February 1937.

[14] National Archives and Records Service, College Park MD [hereafter NARA], RG94.580, memorandum from the Chief of Air Staff, 10 May 1940. On Arnold's belief that the United States could be bombed see US Air Force Academy, Colorado Springs (USAFA), Hansell papers, Series III, Box 1, Folder 2, Henry Arnold lecture 'Can We Be Bombed?', 22–3.

narrow concern with hemisphere defence, the Air Corps came to promote an air technology more appropriate for a range of global security threats.

The security fears in Britain and the United States were not mere fantasies. In Germany by the late 1930s serious thinking was being given to the development of a number of multi-engine bombers capable of trans-Atlantic operations. The German perspective on security included the idea that at some stage in the near future it might be necessary to project air power against the United States or deep into the Soviet hinterland. For all the emphasis on ground-support aviation in Germany, the German Air Force leadership assumed that long-range high-performance bomber aircraft would be indispensable to German security in the 1940s. In 1938 an interim bomber was chosen, the Heinkel He 177, but its range was too limited for the threats it was supposed to cope with.[15] In 1939 work began on prototypes of genuine intercontinental bombers and throughout the war development continued on the so-called 'Amerikabomber' (either with intercontinental range, or a piggy-back solution using two aircraft) and on a rocket-powered projectile that could reach American cities.[16] In Germany, as in Britain and the United States, the changed prospects for global war against distant enemies accelerated the search for vanguard aeronautical technology capable of projecting force beyond the reach of armies and navies.

THE NECESSITY FOR TECHNOLOGICAL PARITY

If changing global security prospects explain the pursuit of air forces designed to enhance military striking power, the rapid changes both in aeronautical technology and in air armament in the inter-war years generated a continuous search for technical advances that matched these changing security needs. Indeed so rapid were these developments that the threat of obsolescence acted as a permanent spur to developing vanguard technologies and applying them as soon as practicable to the operational air forces. Since an aircraft model could commonly be designed, developed, and tested in less than two years (where today it takes a decade or more), a high premium was placed on making sure that the right planning decisions were made.

In the context of the aerial arms race there were significant problems to overcome. Most air forces realized that they faced an awkward choice between opting to produce large numbers of aircraft that were currently up-to-date or waiting until the most advanced aircraft were ready, and risking a relative, if temporary, weakness. The Italian Air Force, for example, was strong on paper in the 1930s because Benito Mussolini (Air Minister from 1933, as well as Italy's dictator) insisted on a

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[15] Richard Overy, 'From "Uralbomber" to "Amerikabomber": The *Luftwaffe* and Strategic Bombing', *Journal of Strategic Studies* 1 (1978), 156, 167–70.

[16] Ulrich Albrecht, 'Military technology and National Socialist ideology' in Monika Renneberg, Mark Walker, eds., *Science, Technology and National Socialism* (Cambridge, 1994), 98–100; Michael Neufeld, *The Rocket and the Reich: Peenemünde and the Coming of the Ballistic Missile Era* (New York, 1995).

large shop-window air force. But the development of a new generation of larger long-range bombers and high-performance monoplane fighters was delayed by this decision, and left the Italian Air Force by 1940 over-committed to biplanes and light bombers and unequal to combat with potential enemies.[17] The French Air Force too was large by international standards in the mid-1930s, and failed to anticipate soon enough the need to move rapidly beyond the biplane age to a new generation of aircraft or to agree on what aircraft types were most urgent. By 1938 half French aircraft were still biplanes.[18] By contrast, the German Air Force, which foreign observers mistakenly regarded as a 'shop-window' creation in the 1930s, eschewed the rush to produce current models and instead focused on large numbers of trainer aircraft between 1934 and 1937, until German aircraft designers had developed a core of advanced fighter and bomber aircraft that would take Germany into the early 1940s at the cutting-edge.[19] Even here the need to find stopgaps meant that some of the bomber force (the Dornier Do 17 and the Heinkel He 111) were approaching obsolescence.

What is striking about the aerial arms race is the extent to which the technology was widely available and understood. There were few 'secret weapons' in the 1930s, though this did not stop politicians and airmen from suspecting that there were. In the 1920s and early 1930s there was widespread trade in aircraft, aero-engines, and equipment. Technology transfer was a natural process in a world largely free from war and with pressure to extend the possibilities of air travel. The rapid development of civil aviation encouraged the development of high performance aircraft and important subsidiary equipment for navigation and safety. Major aircraft types in the 1930s grew directly out of civilian designs—the Heinkel He 111 medium-bomber and the Boeing B-17 heavy-bomber are well-known examples. The German Lorenz navigation beams had an important civilian application but could easily be adapted to military use. The existence of applications shared between civilian and military aviation equipment proved to be a bonus when serious air rearmament began.[20] Aero-engine development was the most complex aspect of the technical frontier, but it was assisted by the passion for motor-racing in the inter-war years. Not for nothing did Bristol, Daimler Benz, and Hispano Suiza specialize in high-performance cars as well as aircraft motors.

Some developments were nevertheless kept as far as possible concealed because of their implications for air strategy. Radio direction finding (Radar) promised to transform the possibilities of effective air defence. Although the popular myth

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[17] Gregory Alegi, 'Qualità del materiale bellico e dottrina d'impiego italiana nella seconda guerra mondiale: il caso della Regia Aeronautica', *Storia Contemporanea* 18 (1987), 1200–3; Lucio Ceva, Andrea Curami, 'Luftstreitkräfte und Luftfahrtindustrie in Italien, 1936–1943' in Horst Boog, ed, *Luftkriegführung im Zweiten Weltkrieg* (Bonn, 1993), 115–18; Joseph A. Maiolo, *Cry Havoc. How the Arms Race Drove the World to War 1931–1941* (New York, 2010), 218–19.

[18] Higham, *Two Roads to War*, 132–3, 136–7, 168.

[19] Richard Overy, 'German Air Strength 1933 to 1939: A Note', *The Historical Journal* 27 (1984), 469. Trainers made up 6,228 of the 10,675 aircraft produced between 1933 and April 1937.

[20] An important case study is Albert Fischer, 'Die Lufthansa als Instrument der geheimen Rüstungspolitik? Ziviler Luftverkehr und Militarisierung in der Weimarer Republik', *Militärgeschichtliche Zeitschrift* 64 (2005), 465–86. Fischer argues that civilian interests were served by the military rather than the other way round, though there were grounds for collaboration too.

remains that the British developed radar long before the rest, radar development was widespread among all the major powers, and indeed in Italy was in some respects ahead of developments elsewhere (only to stumble on the indifference of the Italian Air Force to its implementation).[21] Since this was not a shared technology, some states entered the war still reliant on cumbersome aural devices, which could detect engine noise, though poorly, but could not estimate speed or height. Bombsights were also a closely guarded secret until they fell into enemy hands during the war. When on the eve of the Second World War, Neville Chamberlain wrote a personal letter to President Roosevelt asking him to release the Norden gyroscopic bomb-sight, developed by the Dutch-American Carl Norden in the early 1930s, Roosevelt refused.[22] The design was passed on to the German Air Force through espionage, and many of its features could be found in the Carl Zeiss Lotfernrohr 7 bombsight. The strictest secrecy surrounded thinking about the possibility of developing nuclear weapons, since these promised high levels of destruction using only a handful of aircraft or missiles, representing a quantum leap in air-force technology. It was difficult to keep the science a secret in the 1930s, but the extent to which this had been applied to bomb development programmes did remain secure, at least across enemy lines. The likelihood that nuclear weapons would be developed in the 1940s, and the possibility of ballistic missile technology, already opened the way to a new and more dangerous arms race, whose roots lay in the search for vanguard technologies for air power in the 1930s.[23]

   In the aerial arms race there was never an optimum position for any air force, because of the rapid pace of the engineering and scientific breakthroughs associated with aviation technology. The ability to stay ahead in the arms race depended on two critical variables. The first was the capacity of the aeronautical industry to respond to changes in aircraft and weapons design in order to meet or, often, to anticipate what an air force might require. The aircraft design developments of the 1930s meant that only a handful of industrialized states would be able to meet the challenges posed by innovation in the air or generate sufficient investment to maintain the momentum of research and development. One of the difficulties facing the Italian Air Force—when it was evident that rapid expansion on modern lines was required—was the structure of the aircraft industry, with heavy reliance on small firms and specialized contractors whose industrial practices were more appropriate for the age of wood and fabric biplanes. In 1941 the Air Ministry complained to Mussolini that the Italian air industry 'has maintained its original artisanal character', making series production and rational selection of aircraft types impossible.[24] Robin Higham has found that the French aircraft industry too,

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[21] Luigi Castioni, 'I Radar industriali italiani. Ricerche, ricordi, considerazioni per una loro storia', *Storia Contemporanea* 18 (1987), 1223–4. On British radar see Colin Dobinson, *Building Radar: Forging Britain's Early-Warning Chain, 1935–1945* (London, 2010), chs, 3–5.

[22] Franklin D. Roosevelt Library, Hyde Park, President's Secretary's Files, Secretary's Files, Box 32, Chamberlain to Roosevelt, 24 August 1939; Roosevelt to Chamberlain, 31 August 1939.

[23] See for example Kirk Willis, 'The Origins of British Nuclear Culture, 1895–1939', *Journal of British Studies* 34 (1995), 59–89.

[24] Archivio Centrale dello Stato, Rome [hereafter ACS], Ministero dell'Aeronautica, Busta 46, file 21, memorandum for the Duce from the Air Ministry 'L'aeronautica e la guerra', 18 November 1941, 16.

for all its early design successes was wedded to small firms and outmoded production methods with a high ratio of skilled artisan labour.[25]

None the less, in France as well as in Germany, Britain, and the United States there existed considerable potential to expand development and output of advanced air equipment in large numbers. The Soviet Union and Japan also developed large modern aircraft sectors, although both relied heavily on imitating developments elsewhere. Aircraft manufacturers played a central role in pioneering new technology, and some of the most successful projects began as private ventures, in the sense that they were not responses to an air-force operational requirement (the Hawker Hurricane monoplane fighter, or the de Havilland Mosquito are well-known examples). In this they were spurred by commercial ambitions as well as the technical challenges, although this could also bring its own problems. German firms were notoriously egocentric once large-scale state orders began to pour in and unwilling, even when their promises could not be kept, to accept an end to failed projects. Competition in the American aircraft industry was equally fierce but until the advent of large scale American air rearmament in 1940–1, the competition focused on commercial aviation, encouraging developments that in the long run were likely to benefit air-force procurement. The British development of a so-called 'family' of privileged firms had the disadvantage that outsider innovation was less likely, but it did help to foster close links with the RAF and its thinking. In both Britain and Germany substantial investment in the closing years of the 1930s was designed to ensure that in the event of war, large-scale production of high-quality aircraft could be sustained.[26]

The second variable was more significant: the technical aspects of the aerial arms race depended on the nature of the organizational structures and evaluation mechanisms set up by the different air forces. The ability of the air force to make the 'right' selection depended on a wide range of technical issues and on the personalities involved. Since air forces were looking forward to future developments (unlike the historian, who has the privilege of looking back), the 'right' solution was seldom entirely clear. Because of the highly technical nature of the sector, the selection procedures were specialized and complex. The German Air Force relied on the co-called 'C-Amt', which became the Technical Office when the German Air Ministry was reorganized in 1936. The Office had permanent staff responsible for evaluating and commissioning all air equipment. Many, though not all, were technical officers, familiar with the engineering and the science they were presented with. As a result, the German Air Force made a great many of the right decisions, on everything from medium-bombers to radar, navigation aids, and anti-aircraft artillery, though even the presence of personnel with an extensive technical background did not avoid the problems of industrial self-interest, or intervention

[25] Higham, *Two Roads to War*, 164–5.
[26] The best guide to the British experience is Sebastian Ritchie, *Industry and Air Power: The Expansion of British Aircraft Production 1935–1941* (London, 1997). On Germany see Lutz Budrass, Jonas Scherner, Jochen Streb, 'Fixed-Price contracts, learning, and outsourcing: explaining the continuous growth of output and labour productivity in the German aircraft industry during the Second World War', *Economic History Review* 63 (2010), 107–36.

from senior commanders who lacked such a background, as the war was later to demonstrate.

The British system by comparison was amateur. There was no permanent technical office staffed by engineers and scientists, so that the decisions taken by the Operational Requirements Committee or the Air Staff reflected considered judgement but no particular aptitude. It is otherwise difficult to explain why the RAF developed the operationally disastrous Battle light bomber in the late 1930s, or failed to insist on an effective bombsight and on electronic navigation aids, or neglected to pay sufficient attention to the design and blast-quality of British bombs. In Italy a decision taken in the early 1930s to separate the research and development branch from procurement had the effect of encouraging a very wide range of experimental models, some of high quality, but reducing the capacity of the air force to make effective judgements about which of the many models to select, or to rein back the habit of the firms to develop new models without the capacity to put them into production.[27] In France there were high-quality aviation engineers trained by the state, but too few made their way into the Air Ministry or the process of technical evaluation. Instead a decentralized system evolved in which it proved difficult to match model choice to doctrine or to lay down firm strategic guidelines to shape the emergence of the enlarged force. Moreover, low priority was given to research, which in 1938 consumed only 0.9 per cent of the air budget.[28]

None of the evaluation mechanisms was perfect but they were in general predicated on the idea that it was essential to match the technical achievements of potential enemies or possible rivals. In the case of the United States, where the Air Corps was in the 1930s subordinate to Army interests, starved of funds, and directed to think narrowly in terms of defending the continental coastline, fear of obsolescence was one of the principal arguments mobilized to allow the Air Corps to procure and test vanguard technology. In arguing the case for the B-17 development in 1936, General Frank Andrews, commander of the GHQ Air Force, insisted that his command should aim for the very highest technical standards in case the international situation suddenly required aircraft of greatly enhanced power.[29] In January 1938 he warned the Secretary of War, Harry Woodring, that the evidence from abroad showed that the trend in bomber development was towards 'ever larger machines, with ever greater range, greater bomb capacity, and greater powers of self-defence' and that American air planning was not 'progressive enough'.[30] The B-17 survived by the slimmest of margins in 1938–9 against army opposition, but the pressure from the Air Corps paid off when Henry Arnold was appointed to command the Air Corps in 1939. He understood the technical necessity of avoiding force obsolescence and authorized the development of what

[27] Alegi, 'Qualità del materiale', 1200–1.   [28] Higham, *Two Roads to War*, 160–4.
[29] David Johnson, *Fast Tanks and Heavy Bombers: Innovation in the U.S. Army 1917–1945* (Ithaca NY, 1998), 163–4.
[30] LC, Andrews papers, Box 11, HQ GHQ Air Force to Sec. of War, 'Air Corps Procurement Program', 24 January 1938, 4.

became the B-29 'Superfortress' bomber and, in 1941, development of the B-36, the first true intercontinental bomber, which would enter service after the end of the war.

The American example illustrates just how arbitrary the conditions of the technical arms race could be, and in particular the role of personality. In Germany, by contrast, the head of the technical department was a political appointee, the former First World War air ace, stuntman, and film star, Colonel Ernst Udet. When he witnessed the test of one of the first aircraft using a turbojet engine he is alleged to have said 'How does it fly without a motor?'[31] There were experts in his office, but he played a part in stultifying the technical development of the second wave aircraft and aero-engines needed during the war. In Britain it was by chance that Air Chief Marshal Hugh Dowding was air member for research and development during the critical period when radar and monoplane fighters were both at an early stage. Dowding recognized and understood the technical possibilities of air defence and continued to promote them when he was made commander-in-chief of Fighter Command in 1936. In Italy decisions on new models rested with the air staff, but ultimately on the air minister, Mussolini. The system in Italy distanced those with the technical understanding from those with the power to approve. In France evaluation was fatally affected by inter-service friction and political division over air doctrine, as well as the decentralized structure of evaluation itself. In this sense the technological arms race was only as purposeful as the institutions and leaders whose task it was to ensure that procurement policies followed in strategically sensible ways the direction in which aeronautical and air weapons research was heading.

DOCTRINAL CHOICES

The arms race in the air was not, of course, undertaken randomly. The choice of air weapons and aerial platforms was dictated by the doctrinal preferences of the different air forces, which in turn were linked with the estimated security risks and the technical capability of the aviation sector to deliver what was needed.

The story of the emergence of air doctrine in the inter-war years is by now well-known.[32] The major states broadly divided between those which favoured strategic bombardment as the central aim of an air force (Britain and the United States) and those whose geopolitical situation and anticipated forms of combat dictated greater

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[31] On Udet and the Technical Office see Richard Overy, *Goering: Hitler's Iron Knight* (London, 2012), 181–2.

[32] See for example Williamson Murray, 'Strategic Bombing: The British, American and German Experiences' and Richard Muller, 'Close Air Support: The German, British and American Experiences, 1918–1941', both in Alan Millett and Williamson Murray, eds., *Military Innovation in the Interwar Period* (Cambridge, 1996), 96–190; Richard Overy, 'Strategic Bombardment before 1939: Doctrine, Planning and Operations' in R. Cargill Hall, ed, *Case Studies in Strategic Bombardment* (Washington D.C., 1998); James Corum, 'Airpower Thought in Continental Europe between the Wars' in Philip Meilinger, ed., *The Paths to Heaven: The Evolution of Airpower Theory* (Maxwell AFB AL, 1997), 151–81.

emphasis on close support for surface operations, either on the ground or at sea (the Soviet Union, Germany, Japan, France). In Italy, where strategic bombing theory had been clearly articulated in 1921 by General Giulio Douhet in his book *The Command of the Air*, there existed an air-force culture that endorsed the idea, but also strong (and ultimately decisive) countervailing pressure from the Italian Army and Navy to focus on supporting the main battle.[33] Admittedly, these doctrinal differences were never absolute. The United States Army and Navy required surface support as well, so that counter-air and ground-support doctrine was developed in the 1930s even while the Air Corps commanders chafed at the bit to be able to focus on strategic bombing.[34] The view of the army leadership was dominated by the idea, expressed by the War Plans Division in 1925, that 'the Air Service is an auxiliary arm' and that in the future too 'the final decision in war will […] depend upon the struggle between the ground forces'.[35] Only in Britain was almost no thought given to army-air force co-operation, but instead from 1936 onwards every effort was made to establish an effective and co-ordinated air defence system, the first of its kind. This choice left Britain unable to exploit air power in the Battle of France in May 1940, but well able to withstand the strategic air attacks mounted by the German Air Force in the Battle of Britain.

Doctrinal differences evidently played a part in the aerial arms race. The force competition between the Soviet Union and Germany in the 1930s (an element of the arms race that is often overlooked) was based on developing large numbers of counterforce fighters to destroy enemy aircraft, as well as battlefield dive-bombers and medium bombers for interdiction of supplies and reserves behind the battle line. These functions played a central part in formal German doctrine on 'The Conduct of the Air War', first published in 1935: 'The will of the nation finds its greatest embodiment in its armed forces. Thus, the enemy armed forces are therefore the primary objectives in war.'[36] The priority for the German armed forces, based on numerous operational studies conducted during the period of enforced disarmament in the 1920s, was to be able to fight effective, mobile, combined-arms offensives against the most likely enemies of the future, the Soviet Union or France. The Soviet Air Force, tied closely to the Red Army, also toyed with the idea of developing a long-range bombing capability in the early 1930s, under the influence of the flamboyant young chief of staff, Mikhail Tukhachevsky, but

[33] On bombing see, for example, General Francesco Pricolo, 'L'aviazione italiana nell'Anno XVIII', *Rivista Aeronautica* 16 (February 1940), 186–8; on the preference for battlefield aviation Furruccio Botti, 'Amadeo Mecozzi' in *Actes du colloque international 'Précurseurs et prophètes de l'aviation militaire'* (Paris, 1992), 133–40. There is a new study of Douhet that explains the background of his thinking and his impact on strategy: Thomas Hippler, *Bombing the People: Giulio Douhet and the Foundation of Air Power Strategy, 1884–1939* (Cambridge, 2013).

[34] Lee Kennett, 'Developments to 1939' in Benjamin Cooling, ed., *Case Studies in the Development of Close Air Support* (Washington D.C., 1990), 42–56.

[35] NARA, RG165/888.24, WPD memorandum for the Chief of Staff 'Reorganization of the Air Forces for National Defense', 6 January 1925.

[36] Karl-Heinz Völker, *Dokumente und Dokumentarfotos zur Geschichte der Deutschen Luftwaffe* (Stuttgart, 1968), 470–82, Luftwaffendienstvorschrift 'Luftkriegführung', 1935; see also James Corum, 'From Biplanes to Blitzkrieg: The Development of German Air Doctrine between the Wars', *War in History* 3 (1996), 87–9, 97.

following experience in the Spanish Civil War, Stalin insisted on curtailing bomber development in favour of large numbers of ground-attack and counterforce aircraft and medium bombers for raids on or just behind the battle-line (and had Tukhachevsky shot for good measure).[37] The French Air Force was never permitted to build up and retain an independent bombing capability because the army wanted to tie aircraft closely to the planning of the ground army. In France (and in Italy too), the air force searched for an ideal type of battlefield aircraft, capable of multiple roles in air-to-air combat, ground attack and fighter-bombing, though in neither case was the search successful. The modern battle plane, fast, heavily armed, and versatile, was beyond the technical capability of the European aircraft industry in the 1930s. Uncertainty about the optimum weapons for ground support operations left both the French and Italian Air Forces with a wide model range but modest numbers of first-line aircraft with at best a modest performance. Japanese doctrine linked the air forces closely to the needs of the army and the navy, but because Japanese forces were almost continuously at war from 1931 onwards in mainland China, force levels and operational practice were dictated not by a peacetime arms race, but by the necessities provoked by actual conflict.

Doctrine developed in the United States in a strategic vacuum, since it was not clear in the 1930s that the American armed forces would ever be engaged in a major war again in the near future. The Air Corps view, taught regularly in the 1930s at the Air Corps Tactical School, was to privilege strategic bombing. 'Bombardment aviation,' wrote General Andrews to the Secretary of War in 1938, 'is the basic element of Air Power.'[38] The Air Corps argument rested on an analysis of modern industrial and urban society, whose close-knit and interdependent network of production and services was, as Major Harold George put it, 'much more vulnerable' than the structure of pre-modern societies. 'It appears that nations are susceptible to defeat,' claimed George in a lecture in 1936, 'by the interruption of this economic web.'[39] Continual pressure from the Air Corps eventually ensured that heavy bomber projects survived the opposition from the ground army, and when Roosevelt gave the green light for large-scale air rearmament in 1939, the Air Corps argument for a large core of heavy bombers was accepted.[40] Nevertheless, the development of effective counterforce and support aviation for surface forces continued, despite the absence yet of any clear threat or the prospect of intervention in overseas conflicts. In the case of American naval aviation

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[37] K. R. Whiting, 'Soviet Aviation and Air Power under Stalin, 1928–1941' in Robin Higham, Jacob Kipp, eds., *Soviet Aviation and Air Power: A Historical View* (London, 1978), 50–63; on the fate of the bombers see Leonid Kerber, *Stalin's Aviation Gulag: A Memoir of Andrei Tupolev and the Purge Era*, ed. Von Hardesty (Washington D.C., 1996), 5–13.

[38] LC, Andrews papers, HQ GHQ Air Force to Secretary of War, 24 January 1938, 4. See also Tami Davis Biddle, *Rhetoric and Reality in Air Warfare: The Evolution of British and American Ideas about Strategic Bombing, 1914–1945* (Princeton NJ, 2002), 161–4.

[39] LC, Andrews papers, Box 11, Lecture at the ACTS by Major Harold George, 'An Inquiry into the Subject War', 17.

[40] Jeffery Underwood, *The Wings of Democracy: The Influence of Air Power on the Roosevelt Administration, 1933–1941* (College Station, 1991), 135–7.

this emphasis on fleet air support was to prove critical in the war in the Pacific following Pearl Harbor.

   In Britain, air doctrine rested on two antithetical premises. First, that a strategic striking force was necessary either to deter an enemy from bombing Britain, or to be used in a sustained offensive against an enemy war economy and the morale of the civilian workforce. Since attacks on civilian targets were regarded as illegal by the British chiefs of staff and the Air Ministry, RAF planning in the 1930s was based on the assumption that economic target systems (oil, transport, iron and steel, chemicals etc.) could be hit with sufficient force and accuracy to cripple them.[41] Hence the continuous search throughout the 1930s for the 'Ideal Bomber' capable because of its speed, ceiling, and bomb lift of achieving these goals and matching the threat posed by the most likely potential enemy, Germany. But hence, too, the second strand of British air rearmament, the air defence system, which was designed to ensure that if Germany were not deterred, then at least the force of its bombing offensive could be blunted. This was an entirely different type of 'race', since it meant completing a defensive system before the point came when war with Germany might be a possibility. It is striking that for all his apparent pursuit of appeasement, Prime Minister Neville Chamberlain played an important part in pushing for the early development of an air defence structure based on radar, fast high-performance monoplane fighters, and anti-aircraft fire, integrated by a nationwide network of communication. The potential contradiction that this represented—preparing to bomb Germany, but simultaneously building an air defence network that was supposed to be capable of repelling bombing—seems not to have been confronted at all in air-force discussions in the late 1930s. When it had to be finally addressed in 1941, after the experience of the Blitz, the RAF sidestepped the possibility that German air defence could limit British bombing by arguing that the German population displayed a 'lack of moral fibre', so would crack under the impact of bombing, whereas the British had not.[42]

   This last example shows the extent to which the aerial arms race was dependent on the kind of doctrinal choices each major state made. They were not all running the same race in the 1930s. Since these choices depended on geopolitical realities and judgements about future potential enemies, air forces either opted for what they perceived as being in their own best interests, or in many cases were compelled to accept a force structure and doctrinal preferences which suited the other armed services, as in France. In most cases the other services preferred some form of combined operations in which air power would be an important auxiliary to army or navy operations but independent in only the loosest sense. The arguments

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[41]   On the issue of illegality see TNA, AIR 41/5, 'International Law of the Air 1939–1945', confidential supplement to 'Air Power and War Rights', report by J. M. Spaight for the Air Ministry, 7; Peter Gray, 'The Gloves Will Have to Come Off: A Reappraisal of the Legitimacy of the Bomber Offensive against Germany', *Air Power Review* 13 (2010), 15–16.

[42]   On these arguments see Richard Overy, '"The Weak Link?": The Perception of the German Working Class by RAF Bomber Command, 1940–1945', *Labour History Review* 77 (2012), 15–18. On 'lack of moral fibre', Churchill College Archive Centre, Cambridge [hereafter CCAC], Bufton papers, BUFT 3/11, 'Report on the interrogation of American legation and consular officials in Lisbon 24–31 July 1941', 6 August 1941, 2–4.

of the American ground army in the 1930s against building a force of heavy bombers rested on a number of assumptions: first, that independent air power had nowhere proved itself effective; second, that bombers were costly and two or three smaller combat aircraft could be built for the money spent on a B-17; third, that heavy bombers were highly vulnerable to air defences, were limited by the logistical chain that would be needed to supply them, and would require a degree of operational complexity that smaller aircraft did not.[43]

Army interference in choices about air rearmament was evident in almost all air forces except the RAF. Although doctrine could be developed by air forces on their own behalf (as in the British case) the arms race in the air was seldom autonomous, given the widespread preference not only in other services but also within many air forces for an aviation doctrine that emphasized support for the ground war. The same could not be said for the navies of the great powers. Naval air power remained in many cases the Cinderella of the rearmament drive. In Germany little thought was given to the development of a separate naval air force when the main air contribution was expected to be on land. Naval vessels and merchant ships could be attacked by shore-based aircraft, and mines laid in the main shipping lanes by air.[44] The German Air Force thought about the possibility of an air–sea blockade of Britain, but assumed that the air component would be supplied by the regular air units. Air power as an integral element in naval power was most evident in Japan and the United States, though even here the navies still expected major naval units to be able to defend themselves against air attack. Sea-based aviation in aircraft carriers became a specialized technical and production effort linked to a doctrine that saw naval aviation as a necessary auxiliary for reconnaissance, air defence of the fleet, and air-to-surface operations. This sector of the aerial arms race was confined largely to the Pacific theatre, where during the war it proved every bit as important as the development of ground-support aviation for the army in Europe.

INTELLIGENCE AND AIR FORCE SIZE

The question asked in any arms race is usually: how many does the enemy have? In the case of the pre-1914 arms race this was not a difficult question to answer, since dreadnoughts could not easily be concealed and the size of armies could simply be calculated from conscription laws. Aircraft posed a different problem. In the 1930s it was difficult to calculate the capacity of an enemy aircraft industry as it rapidly expanded; estimates of enemy air strength could be calculated from effective photo-reconnaissance or knowledge of the organizational structure of the force, but these would reveal little about the situation of reserves or the potential for

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[43] NARA, RG94/452.1, Maj. General Stanley Embick to Assistant Chief of Staff, 9 May 1938; General Marlin Craig, memorandum for the Joint Board, 'Army Bombardment and Reconnaissance Aviation', 2 June 1938.

[44] For the best account see Sönke Neitzel, *Der Einsatz der deutschen Luftwaffe über dem Atlantik und der Nordsee 1939–1945* (Bonn, 1995), 12–20.

wartime mobilization. Nevertheless, intelligence was one way to gauge not only what technologies to adopt, but above all what size an air force should be.

For states with large armies that expected close air support, the size of the air force was to some extent determined by the size of the potential army. In Germany each air fleet was assigned in the event of war to support a particular army group, so that a sufficient mix of aircraft types, on a scale likely to afford effective air cover and contest for air superiority, dictated the size and structure of the force. For potential enemies, however, estimating force size depended on being able to predict the likely quantity of German aircraft, and to understand their relative quality (first-line, second-line, reserves); the German Air Force, in turn, had to understand the size and force structure of likely adversaries in order to be able to provide adequate defence or to be sure of winning the war for air superiority. To gain firm intelligence of this kind was intrinsically difficult. Even where it existed it was not easy to interpret. When the former British air attaché in Berlin, Group Captain Malcolm Christie, began to feed reports on German air rearmament to the British Foreign Office in 1935, he provided an exaggerated picture of German air capabilities by judging trainer and transport aircraft to be fighters and bombers.[45] German estimates of British air potential generally underestimated RAF rearmament and British aircraft output, since the 'shadow-factory' scheme (tooling up plant for conversion from civilian to military orders when war came) was difficult to identify. Espionage certainly occurred, but from its nature it mainly provided information on local units or a particular factory rather than hard evidence about Air Ministry plans.

Two examples illustrate the extent to which the intelligence picture played a role in determining choices made in the arms race. The first is the air scare in Britain in 1935–7, when popular fears of German air rearmament were fuelled by those keen to exaggerate the scale in order to encourage a competitive British rearmament—notably Winston Churchill, who was given access to the Christie reports—and by those hopeful that the bombing threat might contribute to more energetic pursuit of air disarmament.[46] During the mid-1930s the actual scale of German air rearmament was subject to wide (and often wild) speculation and this helped to push the government to embark on competitive air rearmament, not necessarily to match German output, but to ensure that the priority areas (bombing and air defence) would be large enough to protect Britain from any possible attack. Indeed the constant emphasis on the potential German bomber force (Christie estimated that 60 per cent of all aircraft produced in Germany were bombers) and the potentially catastrophic effects of urban bomb attack, helps to explain the firm RAF commitment to developing a striking force of bombers, and to the wisdom of developing an air defence system, rather than preparing the force at all for a possible role in a ground campaign. Arguably, exaggerated intelligence and public anxiety both played a part in these calculations, although air doctrine already leaned in this direction.

[45] CCAC, Christie papers, 180/1, file 7, memorandum 'Germany Air, September 1935'.
[46] On the relationship between popular opinion and air rearmament see Brett Holman, 'The Air Panic of 1935: British Press Opinion between Disarmament and Rearmament', *Journal of Contemporary History* 46 (2011), 288–307.

None the less, as Wesley Wark has shown, British air intelligence estimates of German force size by the late 1930s were actually close to the reality, and only became distorted in the early stages of the war because of a mistaken calculation of German squadron size.[47]

The second example is the American estimate of German air strength and potential output in 1939–41 as America joined the aerial arms race. There has been a good deal of speculation about why President Roosevelt chose the figure of 50,000 airplanes for his initial air programme, since it was on a scale that dwarfed the modest aircraft production of the 1930s and was adopted long before the United States was actively involved in war. One explanation might lie in the consistent overestimation by American military intelligence (G-2) of German air strength in the late 1930s. The Air Corps chose to use German output as a measure of what the United States might be up against, partly to boost their argument for more air resources. In January 1939 Roosevelt was sent information from an uncorroborated source that Germany had a wartime capacity of 20,000 aircraft a month, and current air strength of 25,000 aircraft.[48] These were fanciful figures, but estimates provided from the air and naval attachés in Berlin later in the year suggested that German front-line strength was at least 14,500 aircraft and annual output running at 17,500, rising to 25,000 (whereas actual first-line strength was 3,609, and output in 1940 a more modest 10,247).[49] Even higher figures were presented by the G-2 air force branch in January 1941, which insisted that Germany had currently 11,000 first-line aircraft with at least another 11,000 in reserve and would be producing at the rate of 48,000 aircraft a year (against actual output of 11,776).[50] Production figures were extrapolated partly by assuming that the rate of output in modern German factories must be comparable with output from the same floor-space in American plants. Exaggerated though all these estimates proved to be, there seems every reason to assume that Roosevelt's insistence on aircraft production in tens of thousands drew its justification from the anticipated strength of potential enemies rather than being simply a stroke of strategic imagination.

Intelligence was never enough, however, to define the scale of the aerial arms race on its own. The size of the air forces depended also on the cost, which is why in discussion about the selection of air-force types, value for money also had to be taken into consideration. US Army claims in early 1938 that at least five battlefield light bombers could be produced for the cost of one long-range bomber were not unique.[51] In Germany, the arguments surrounding the choice of the new generation of medium bombers, which resulted in the Junkers Ju 88, owed something

[47] Wesley Wark, 'British intelligence on the German Air Force and aircraft industry, 1933–1939', *The Historical Journal* 25 (1982), 627–48. See also Overy, 'German Air Strength', 465–71.

[48] NARA, RG 94/452.1, telegram for the President, 17 January 1939.

[49] LC, Arnold papers, Box 246, G-2 Report, 16 January 1941 'Germany, Domestic production, capacity and Sources of Aviation Equipment', 2–5. German figures from Richard Overy, *The Air War 1939–1945* (New York, 2007), 23, 150.

[50] LC, Arnold papers, Box 246, Lieutenant Colonel E. Whitehead to Chief of Intelligence Branch, 'Estimate of German Air Strength' 21 January 1941.

[51] NARA, RG 94/452.1, Memorandum for the Chief of Staff, 'Revision of Present Approved Airplane Program', 19 July 1938.

to the view that for every heavy four-engine aircraft perhaps three times as many medium-bombers could be produced using the same resources. In Britain, on the other hand, measurement of bomb lift when comparing the cost of medium and heavy bombers was used in the late 1930s to justify the switch to the more expensive four-engine models because they could carry considerably more tonnage than a larger number of medium types. It was calculated that it would take 3,584 medium bombers to drop 4,000 tons, but only 896 heavy bombers to drop the same amount. The mediums would cost £79 million against only £47 million for the heavier aircraft.[52] Air forces were expensive because of the specialized personnel, long and costly training, large resources needed for bases and equipment, and the cost of advanced aircraft. Air forces typically took around 30 per cent of the military budget in the 1930s, so close attention to costs was essential. Technical advances and force size were conditioned by the financial and material resources available, as well as the security calculations and doctrinal preferences.

   How much this was the case in the inter-war years is a question that would repay further research.[53] What is clear is that financial considerations could affect the strategic choices made. In Britain preference was given from 1936 to air defence, which meant less money was available for the expansion of the bomber force. In Germany plans for the rapid expansion of the air force had to take account of the problems of funding rearmament in general, which reached a difficult point in spring 1939 as rising military costs threatened a further financial crisis. A financial New Plan published in April found creative ways of generating further credit for the armaments boom, by which point air-force expenditure consumed 6 billion of the 17.2 billion marks allocated for defence in 1938/9.[54] For the command economies in Germany and the Soviet Union, finance could in the end be found through economic coercion, but for Britain and France the money had to be argued for against the claims of domestic consumption and exports, which meant that money for defence was allocated to the most urgent priorities first—air defence in Britain's case, expansion of the army and the Maginot Line in France.[55]

   The arms race in the air in the inter-war years was driven by a range of distinct imperatives but conditioned by the limiting factors of cost, industrial capacity, resources, and intelligence on potential enemies. It was also conditioned by the attitude of the other two services and the extent to which air power was seen as auxiliary or subsidiary. In no case did the air force succeed in persuading the other services or the government that air power alone could decide a future contest, so that the aerial arms race took place against a background of sceptical or cautious

[52] TNA, AIR 8/244, Air Staff note on the size of bomber aircraft, 22 December 1938, 1–5.
[53] On financial implications for air power see Richard Overy, 'Coût de la guerre aérienne pendant la 2è Guerre mondiale: problèmes budgétaires et financiers' in *Actes du colloque international: Aviation militaire: Survol d'un siècle* (Paris, 1999), 269–84.
[54] Budget figures in Bundesarchiv Berlin R2/21776–81, Reich Finanzministerium, 'Entwicklung der Ausgaben in der Rechnungsjahren 1934–1939', 17 July 1939. On the New Finance Plan R2501/3485, Reichsbank, 'Die Durchführungsverordnung zum Neuen Finanzplan', 28 April 1939.
[55] On the financial constraints in Britain see George Peden, *British Rearmament and the Treasury 1932–1939* (Edinburgh, 1979) and on France, Robert Frankenstein, *Le prix du réarmament français 1935–1939* (Paris, 1982).

approval by the rest of the defence establishment. The American Baker Board, appointed in 1934 to assess the future of American military aviation, concluded that 'the idea that our aviation can replace any of the other elements of our armed forces is found, on analysis, to be erroneous […] the army, with its own air forces, remains the ultimate decisive factor in war'.[56] The air forces suffered from the fact that armies and navies had been fully exploited in modern forms of combat for decades. The aerial arms race had many destabilizing and inhibiting factors to contend with, but the risks in air power calculations were, until the onset of war in 1939, an unknown quantity. 'There is one incontrovertible fact,' wrote the G-2 section of the Air Corps Combat Command in 1939, 'Air Power as visualized in terms of hundreds of Bombers and hundreds of tons of bombs has not yet been tested.'[57]

Did the aerial arms race affect decisions for war or peace in the 1930s? A strong case has been made for the argument that Chamberlain was willing to give away the Sudetenland to Germany in September 1938 because of the widespread fear that if war came German bomber fleets would soon be over London, pulverizing its resistance.[58] This view nevertheless plays down the extent to which both Britain and France were prepared to envisage war if Germany invaded Czechoslovakia unilaterally; in the end Hitler was deterred from waging the small war he wanted. Moreover, the air threat played little part in the crisis over Poland as it unfolded from the spring of 1939, except that all of the major states involved increased the provision of civil defence facilities, greatly strengthened anti-aircraft artillery, and hastily installed newly-developed radar equipment in the hope that it would be possible in the event of war to combat enemy bombing by passive and active defences. A stronger case can be made for the idea that both Britain and Germany, the principal runners in the arms race, thought that air power would act as a *deterrent* to the prospect of war as long as it could be made clear to the other side that bombing would be matched by bombing.[59] This repeated the terms of the naval race before 1914, and was similarly unsuccessful in limiting the decision for war. When war came in September 1939 all the states involved agreed to abide by Roosevelt's request that they should avoid the bombing of cities and killing of civilians and for the first months of war the expected rain of bombs on London, Paris, or Berlin did not materialize. The air race mattered most to the extent that it prepared almost all the belligerent states to wage major air warfare in all its many forms at, or near, the threshold of technical and scientific development.

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[56] NARA, RG 165/888.21, Final report of War Department Special Committee on Army Air Corps, 18 July 1934, 12.

[57] NARA, RG 18/258, Box 4, HQ Air Force Combat Command, 'The GHQ Air Force' [1939], 4.

[58] Gerald Lee, '"I See Dead People": Air-Raid Phobia and Britain's Behaviour in the Munich Crisis', *Security Studies*, 13 (2003/4), 230–72. See also Brett Holman, 'The Air Panic of 1935: British Press Opinion Between Disarmament and Rearmament', *Journal of Contemporary History* 46 (2011), 288–307.

[59] Richard Overy, 'Air Power and the Origins of Deterrence Theory before 1939', *Journal of Strategic Studies* 15 (1992), 73–101.

Richard Overy

INDONESIA
Java
Sumatra
MALAYA
Borneo
SOUTH VIETNAM
THAILAND
Indian Ocean
EAST PAKISTAN
LAOS
BURMA
INDIA
PHILIPPINES
CAMBODIA
TIBET
PAKISTAN
TAIWAN
NORTH VIETNAM
AFGHANISTAN
ETHIOPIA
Okinawa
S. KOREA
CHINA
IRAN
SAUDI ARABIA
JAPAN
IRAQ
SUDAN
N. KOREA
MONGOLIA
TURKEY
EGYPT
CHAD
SOVIET UNION
GREECE
LIBYA
EAST GERMANY
Pacific Ocean
POLAND
FINLAND
ITALY
TUNISIA
SWEDEN
FRANCE
ALGERIA
Arctic Ocean
NORWAY
WEST GERMANY
UK
SPAIN
GREENLAND
IRELAND
PORTUGAL
ICELAND
MOROCCO
HAWAII
Azores

Miles
0   1500
0   2000
Kilometres

CANADA
Atlantic Ocean

UNITED STATES
BERMUDA

PUERTO RICO
DOM. REP.

The Global Cold War in the early 1960s
Countries allied with the United States
Communist bloc countries

MEXICO
CUBA
HAITI

GUATEMALA
NICARAGUA
EL SALVADOR
VENEZUELA
COSTA RICA
PANAMA
COLOMBIA
BRAZIL

Map 3. The Global Cold War

PART III

THE COLD WAR ARMS RACE

Introduction

Thomas Mahnken

As the previous chapters in this volume have demonstrated, arms competitions have a long history. It was during the Cold War, however, that the study of arms races assumed a central place in the newly emerging field of strategic studies. Indeed, the US–Soviet competition spawned a considerable body of literature on arms races.

Writing in 1971, Colin S. Gray defined an arms race as 'Two or more parties perceiving themselves to be in an adversary relationship, who are increasing or improving their armaments at a rapid rate and restructuring their respective military postures with a general attention to the past, current, and anticipated military and political behaviour of the other parties.'[1] In other words, for Gray, an arms race had four essential elements. First, it must involve at least two parties. Second, each party must structure its armed forces consciously in reference to the other competitor. Third, the parties must compete with one another in terms of the quantity and/or quality of their armed forces. Finally, their interaction must lead to a rapid increase in the quantity and/or quality of arms.

The Cold War appeared to meet Gray's criteria (see Figures III.1–III.3). The United States, the Soviet Union, and their allies structured their armed forces in reference to one another. Moreover, superpowers appeared to compete with one another in terms of both the quantity and the quality of arms they procured. Such a dynamic was clearly apparent regarding the size and characteristics of nuclear arsenals and nuclear delivery vehicles and of space systems, as well as conventional arms. And, at least during the early phases of the Cold War, their interaction led to a rapid increase in the size and destructiveness of their arsenals.

Scholars writing during the Cold War devised a number of different explanations for the pattern of superpower interaction. One group emphasized external sources of arms competition. The most common, and simplistic, formulation was the 'action-reaction' model of arms races. At its core, this model holds that the

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[1] Colin S. Gray, 'The Arms Race Phenomenon', *World Politics* 24/1 (1971), 40.
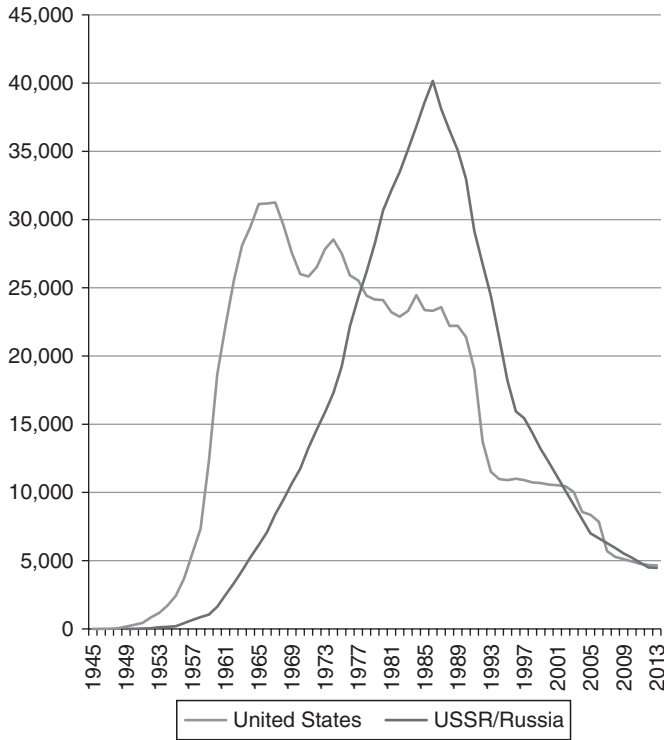
Figure III.1. US–USSR/Russia Nuclear Weapons Stockpiles, 1945–2013

search for security, combined with uncertainty and worst-case estimates of a competitor's intentions and capabilities, will yield efforts to amass ever-greater stockpiles of weaponry. That is, exaggerated fears and over-estimation of opposing threats will lead to the spiralling growth of armaments and arms spending. This tendency is abetted by the fact that plans for fielding weapons are often made before the appearance of the systems they are meant to counter.[2]

Central to action-reaction arms race theory is the concept of the security dilemma. As Robert Jervis noted in 1978, a security dilemma can be said to exist when 'Many of the means by which a state tries to increase its security decrease the security of others.'[3] That is, countries that seek only security conclude that their adversary's motives are more malign than previously believed and act accordingly. The security dilemma is driven by uncertainty over whether a competitor is motivated by security concerns or by more expansive aims.[4] Jervis argued that the magnitude and nature of the security dilemma depend on the offence–defence balance and differentiation between offence and defence.

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[2] George W. Rathjens, *The Future of the Strategic Arms Race: Options for the 1970s* (Washington, D.C., 1969), 25–6.

[3] Robert Jervis, 'Cooperation Under the Security Dilemma', *World Politics* 30/2 (1978), 169.

[4] Charles L. Glaser, 'The Security Dilemma Revisited', *World Politics* 50/1 (1997), 192.
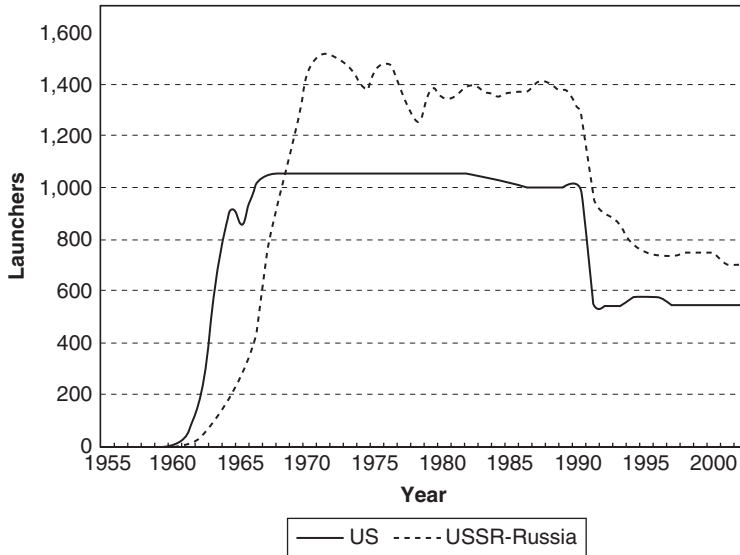
Figure III.2. US–USSR ICBM Launchers, 1950–2002

Figure III.3. US–USSR Strategic Bombers, 1945–2002

Certainly the action-reaction dynamic was an appealing model of US–Soviet strategic interaction, in part because of its simplicity. Secretary of Defense Robert S. McNamara, for example, argued, 'Whatever their intentions or our intentions, actions—or even realistically potential actions—on either side relating to the build-up of nuclear forces necessarily trigger reactions on the other side. It is precisely this action-reaction phenomenon that fuels the arms race.'[5] Similarly, George Rathjens stressed that uncertainty about Soviet capabilities tended to fuel overreactions in the United States, since the US government based its planning on worst-case assumptions. In addition, American plans were based on Soviet capabilities that had yet to emerge.[6]

Despite its theoretical appeal, there is reason to question the extent to which the action-reaction dynamic actually explains Soviet–American strategic interaction. Andrew Marshall's careful reconstruction of Soviet defence expenditures during the late 1960s revealed a much more loosely coupled interaction between the United States and Soviet Union than that predicted by action-reaction theory.[7] In his view, getting a better understanding of the dynamics of the US–Soviet competition required a very different perspective, one that gave greater weight to the organizational context and constraints that the Soviets faced:

> If we really are to understand the nature of the competition, the nature of the interaction process, we will need to understand much better than we do now the decision-making processes within both the US and Soviet political-military-industrial bureaucracies. We need an understanding of the processes that lead to the selection of specific R&D [research and development] programs, to R&D budgets and their allocations, to procurement decisions, to the operation of the whole of the weapons system acquisition process. We would need to understand how the perceptions of what the other side is doing come about in various places within these complicated bureaucracies, and how these perceptions influence the behavior of the various organizations and the decision makers involved in the complex decision processes that drive evolution of the several defense programs involved.[8]

Similarly, Albert Wohlstetter's analysis of US and Soviet defence spending and arms programs during the first two decades of the Cold War showed only a partial connection between the actions of one side and those of the other. He found, for example, that US defence spending was not directly correlated to Soviet actions. Moreover, he showed that while in some cases the United States had overestimated Soviet arms acquisitions, in other cases it had substantially underestimated them.[9]

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[5] Quoted in Charles L. Glaser, 'The Causes and Consequences of Arms Races', *Annual Review of Political Science* 3 (2000), 253.

[6] Rathjens, *The Future of the Strategic Arms Race*.

[7] Andrew W. Marshall, 'Long-Term Competition with the Soviets: A Framework for Strategic Analysis', R-862-PR (Santa Monica, CA: RAND Corporation, 1972).

[8] *Ibid.*, 7.

[9] Albert Wohlstetter, 'Is There a Strategic Arms Race?' *Foreign Policy* 15 (1974), 3–20; Albert Wohlstetter, 'Rivals, but no "Race"' *Foreign Policy* 16 (1974), 48–81.

Furthermore, a highly classified history of the US–Soviet arms competition written by Ernest May, John Steinbruner, and Thomas Wolfe under the sponsorship of the Secretary of Defense and with the benefit of access to a broad range of intelligence sources likewise concluded that 'budgets, forces, deployments, and policies of the United States…were products less of direct interaction with the Soviet Union than of the tension in the United States between dread of communism on the one hand and the dread of deficit spending on the other.'[10]

What we now know about strategic interaction during the Cold War indicates that Soviet leaders paid attention to external developments, but also to internal ones; their attention was selective; they perceived international developments through the lenses of strategic culture, ideology, and bureaucratic politics; and the nature of their response was conditioned by strategic culture, organizational politics, and standard operating procedures. Thus the dynamics of the Cold War diverged significantly from what action-reaction theory predicted.

US and Soviet arms decisions appear to have been the result of a mix of external and internal determinants. First, bureaucratic politics influenced arms decisions. Based upon interviews with and memoirs by Soviet military and industrial leaders, it appears that that bureaucratic politics, in the form of competition between weapons design bureaus and military services, played an important role in determining the shape of Soviet arms investments.[11]

Second, the organizational culture of armed services influenced what they chose to buy. As Robert Perry wrote in the context of the US–Soviet competition, 'Whether Soviet or American, R&D institutions as readily aspire to organizational immortality as do trade guilds or cavalry regiments; instinctively, they resist change.'[12] This is clearly true in the case of the United States.[13] The organizational culture of the Soviet armed forces manifested itself in the existence of the Strategic Rocket Forces and Strategic Air Defenses (*PVO Strany*) as separate services, as well as the Soviet Union's preferences for heavy ICBMs over SLBMs and bombers. In the case of the United States, a preference for strategic bombing dating back to the 1920s led Washington to place a greater emphasis on manned bombers over ballistic missiles.

Third, the structure of bureaucratic processes influenced arms decisions. Franklin Long and Judith Reppy, for example, noted how major differences in US and Soviet research, development, and acquisition systems yielded significantly different force structures.[14] David Holloway noted a strong contrast between a

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[10] Ernest R. May, John D. Steinbruner, and Thomas W. Wolfe, *History of the Strategic Arms Competition, 1945–1972*, Part I (Washington, D.C.: Historical Office, Office of the Secretary of Defense, March 1981), 241.

[11] See, for example, John G. Hines, Ellis M. Mishulovich, and John F. Shull, *Soviet Intentions, 1965–1985*, two volumes, Contract #MDA903–92-C0147 (McLean, VA: BDM Federal, 1995).

[12] Robert Perry, 'American Styles of Military R&D', in Franklin A. Long and Judith Reppy, eds., *The Genesis of New Weapons: Decision Making for Military R&D* (New York, 1980), 107.

[13] Thomas G. Mahnken, *Technology and the American Way of War since 1945* (New York, 2008).

[14] Franklin A. Long and Judith Reppy, 'Decision-Making in Military R&D: An Introductory Overview' in Long and Reppy, editors, *The Genesis of New Weapons*, 13–14.

Soviet practice of evolutionary development and an American preference for large-scale innovation.[15]

Finally, the development of new technology influenced arms decisions. Both the United States and the Soviet Union pursued new military capabilities in search of an edge against their competitor. As Barry Buzan and Eric Herring put it:

> The leading edge of technological advance sets the standard for the international system and its continuous forward movement exerts pressure on the whole process of spread. As the leading edge creates ever higher standards of military capability, followers either have to upgrade the quality of their weapons or else decline in capability relative to those who do.[16]

Military research and development clearly influences weapons decisions, even though it is often easy to exaggerate its significance.

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[15] David Holloway, 'The Soviet Style of Military R&D', in *Ibid.*, 139.
[16] Barry Buzan and Eric Herring, *The Arms Dynamic in World Politics* (London, 1998), 30.

6

The United States and the Cold War Arms Race

Timothy Hoyt

INTRODUCTION

The Cold War and the US–Soviet arms race are virtually inseparable.[1] The exceptional outcome of the Cold War—the fact that the superpowers did not, ultimately, resolve a protracted ideological and geopolitical conflict by violence—is intimately linked with the primary elements of the arms competition—nuclear weapons of unparalleled destructive capacity. The sheer destructiveness of these weapons, which were procured in ever-increasing numbers for a wide range of potential uses, provided a powerful incentive *not* to fight. As a result, the arms race, which lasted through four decades of ideological competition, was driven by the Cold War, but also perversely helped ensure that the Cold War remained cold.[2]

The decades-long duration of this competition, and the significant shifts in US policy that took place during it, make it useful to divide this paper into three periods: the early Cold War from 1945 to 1960 (a period of intense armaments development), a middle period from 1960 to 1978 (marked by efforts to control or manage the arms race), and the resurgence and eventual waning of arms competition from 1978 to 1990. In each of these periods, US policy demonstrated contradictory tendencies. On the one hand, American leaders sought to 'win' the arms race, and use it for distinct military and geopolitical advantage. On the other hand, those same leaders wrestled with the problem of managing or controlling the arms race, given the perceived necessity of a deterrence strategy that promised a rapid nuclear response to any Soviet conventional invasion of Europe, and the simultaneous dangers of inadvertent escalation and even of accidental nuclear war.

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[1] The opinions expressed here are the author's alone, and not those of the US Naval War College, the US Navy, the Department of Defense, or any other agency of the US government.

[2] For other perspectives on this topic, *see* David Holloway, 'Nuclear weapons and the escalation of the Cold War, 1945–1962', in Melvyn P. Leffler, and Odd Arne Westad, eds., *The Cambridge History of the Cold War* Vol. 1 (Cambridge, 2010) and William Burr, and David Alan Rosenberg, 'Nuclear competition in an era of stalemate, 1963–1975', in Melvyn P. Leffler, and Odd Arne Westad, eds., *The Cambridge History of the Cold War* Vol. 2 (Cambridge, 2010); and Jervis, Robert, 'Was the Cold War A Security Dilemma?', *Journal of Cold War Studies* 3/1 (2001), 36–60.

Several important internal and external drivers influenced the development of US strategy in the arms competition. The internal drivers were important and constant throughout the Cold War. The first was the willingness of the United States to make significant investments in its military security—a willingness that was often driven by Congress as well as the demands of successive administrations and the armed services. A second was the ability of the scientific community to develop new weapons and delivery systems, each more lethal and capable than the last.[3] The third was the US commitment to critical allies in Europe and Asia, codified in the policy of containment and an extended system of global alliances. This policy required the US to defend allies far from its homeland against a robust Soviet conventional threat that the Western alliance would not or could not match with conventional forces. These alliances therefore relied on nuclear threats to deter Soviet conventional assault, and such threats had to be survivable and credible.[4] This in turn encouraged inter-service rivalry, as the US armed forces vied for missions and associated budget share. Finally, the defence industrial base became an important driver as the US settled into a long-term arms competition that was unique in its history.

The Soviets, of course, also contributed to the arms competition. Their conventional superiority and geographical proximity to key US allies posed a constant potential threat. US nuclear weapons after 1950 had to deter Soviet nuclear use as well as conventional assault. Changes in perception of Soviet intentions, therefore, were an important driver in US decisions to modernize the nuclear arsenal. Soviet deployment of improved weapons systems and capabilities provided another key driver, forcing the US to review and upgrade basing, deployment, and command and control capabilities throughout the Cold War. The combination of improving Soviet capabilities with unclear Soviet intentions contributed to a number of military and political crises, the most important being the Cuban Missile Crisis of 1962 and the European INF (Intermediate Nuclear Forces) crisis of 1978–83. Each crisis prompted fundamental shifts in US strategy for the arms competition.

EARLY COLD WAR (1945–1960)

The nuclear-weapons issue dominated the US approach to the Cold War arms race. As the first innovator, the US remains the only state to have actually used a nuclear weapon in war. America's nuclear monopoly permitted a massive downsizing of its conventional forces in 1945–9, while still maintaining a robust and confrontational foreign policy based on 'containment' of the Soviet Union.[5] The threat of nuclear use against the USSR, supplementing or replacing more conventional strategic bombing, remained a mainstay of US war planning throughout the

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[3] Norman Friedman, *The Fifty-Year War: Conflict and Strategy in the Cold War* (Annapolis, 2000).
[4] James Schlesinger, 'The Impact of Nuclear Weapon on History', *The Washington Quarterly* 16 (Fall 1993), 5–12.
[5] 'X' (George F. Kennan), 'The Sources of Soviet Conduct', *Foreign Affairs* 25/4 (1947), 566–82.

Cold War.[6] This mission, however, necessitated two subsidiary elements—effective long-range delivery systems, and reconnaissance/surveillance capabilities for pre-war warning, targeting, and damage assessment. The former led to inter-service rivalry, as the US Air Force (long-range bombers and long-range ballistic missiles), Navy (carrier-based strike aircraft, and ship and submarine launched Cruise and later ballistic missiles), and Army (shorter-range rockets and ballistic missiles) pursued competing delivery systems, each of which could menace the Soviet homeland. Reconnaissance and surveillance capabilities became increasingly important as the opacity and sheer magnitude of the Soviet military-industrial complex became apparent.[7]

Technological change drove the arms race in new directions, shaping perceptions and accelerating both states' efforts into a broader competition. The first successful Soviet atomic test in 1949 prompted a reassessment of the containment strategy in the subsequent NSC-68 document, drafted by a National Security Council team and approved by President Truman after its assumption of relentless communist expansionist tendencies was apparently validated by the invasion of the Republic of Korea in 1950.[8] Both the US and Soviet Union began research into, and development of, new weapons technology, and in the 1952–4 period both states successfully tested thermonuclear devices, which could be thousands of times more powerful than the original fission weapons dropped on Hiroshima and Nagasaki.

Soviet nuclear developments, as well as the reverse-engineering and production of a Soviet model of the B-29 bomber (the Tu-4), created a need for homeland defences for the first time. The assumption in NSC-68 that delivery of 100 nuclear devices on key targets could effectively cripple US industrial and mobilization capacity reflected this concern.[9] It led to the development of cooperative early warning systems with NATO allies, and the fielding of large numbers of interceptors in the continental US. Such efforts were spurred by Soviet deception methods, which fuelled the 'bomber gap' scare of the late 1950s (based on exaggerated assumptions about the number of long-range bombers available to the Red Air Force), as well as broader concerns about the survivability of US bases in the event of a Soviet surprise nuclear attack.[10]

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[6] Steven T. Ross, *American War Plans 1945–1950* (London, 1996).

[7] Ross, *American War Plans*, 84–5 notes the problems US planners had in creating war plans due to lack of intelligence on the USSR's industrial base.

[8] 'A Report to the National Security Council by the Executive Secretary on United States Objectives and Programs for National Security', 12 April 1950 (hereafter NSC-68), available at https://www.trumanlibrary.org/whistlestop/study_collections/coldwar/documents/pdf/10–1.pdf.

[9] NSC-68, 20. See also Ken Young (2013). 'Revisiting NSC 68.' *Journal of Cold War Studies*, 15(1), 3–33.

[10] *Foreign Relations of the United States, 1955–1957* [hereafter *FRUS*], *Volume XIX, National Security Policy, Document 9*: 'Report by the Technological Capabilities Panel of the Science Advisory Committee', 14 February 1955 (known as 'The Killian Report') at https://history.state.gov/historical-documents/frus1955–57v19/d9 discusses the emergence of surprise as a critical factor in nuclear strategy, as does Albert P. Wohlstetter, *The Delicate Balance of Terror* RAND P-1472 (Santa Monica: RAND, 6 November 1958, revised December 1958) at http://www.rand.org/about/history/wohlstetter/P1472/P1472.html.

The emergence of long-range missile systems in the late 1950s further spurred the arms race. The development of an intercontinental ballistic missile (ICBM) by the Soviets, and the successful use of a variant of that missile to launch the Sputnik satellite into orbit in 1957, surprised US analysts and policy makers. It also created the appearance of a significant Soviet technological advantage over the West, intensifying public concern over the existence of a 'missile gap' with the Soviets and accelerating weapons development. The emergence of the Soviet Strategic Rocket Forces also accelerated research into defences against missile attack—the first generation of ballistic missile defence (BMD).[11]

During this early Cold War period, both internal forces and external drivers influenced the US role in the arms race. The most important internal force was anxiety over the state of the US economy. From 1945 to 1950, and again in the 'New Look' of the Eisenhower Administration from 1954 to 1960, nuclear weapons were seen as a less expensive alternative to the massive conventional forces that otherwise would have been required to defend NATO and other US allies and interests.[12] Nuclear weapons promised enormous lethality at low cost, and the practical concerns of deployment and the potential effects of actual use were not fully appreciated until later in this period. In addition, US planners envisioned a war with the Soviet Union as a repeat of the Second World War—a protracted war of industrial mobilization, with nuclear weapons simply substituting for more massive conventional bombing strikes. Only with the emergence of thermonuclear weapons did this vision alter.

A second important driver was the pace of technological change. Nuclear weapons themselves increased in destructive power—a B-47 bomber in the late 1950s carried weapons with more than 200 times the destructiveness of the Hiroshima and Nagasaki bombs.[13] After 1950, US production of fissile material expanded exponentially, allowing the warhead stockpile to jump from fifty (in 1948) to thousands in the mid-1950s.[14] The physical size and weight of warheads shrank dramatically, which in turn allowed nuclear weapons to be deployed on much smaller delivery systems. The larger stockpile meant that nuclear weapons could, for the first time, be assigned to battlefield units—initially in a massive 280mm howitzer, but later in dual-use systems, including conventional artillery pieces, single-seat fighter and strike aircraft, and a range of land, sea, and air-launched rockets.

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[11] See *History of Strategic Air and Ballistic Missile Defense: Volume II, 1956–1972* at http://www.history.army.mil/html/books/bmd/BMDV2.pdf.

[12] John Lewis Gaddis, *The Cold War: A New History* (New York: Penguin, 2005), 63. Cf. Aaron L. Friedberg, *In the Shadow of the Garrison State: America's Anti-Statism and its Cold War Grand Strategy* (Princeton NJ, 2000), chapter 4; and William M. McClenahan Jr, William H. Becker, *Eisenhower and the Cold War Economy* (Baltimore MD, 2011).

[13] See 'B-47 Stratojet' at http://fas.org/nuke/guide/usa/bomber/b-47.htm; 'Little Boy' had a 15–16 kiloton (kT) yield; the Mark 15 thermonuclear bomb carried by the B-47 had a 3.8 megaton (MT) warhead, equal to 3,800 kT. See http://www.nuclearweaponarchive.org/Usa/Weapons/Allbombs.html. USAF gravity bombs in this period had yields of up to 25 MT.

[14] David Alan Rosenberg, 'The Origins of Overkill: Nuclear Weapons and American Strategy, 1945–1960', *International Security*, 7/4 (1983), 3–71.

The commitment to defend Europe and key areas of Asia created a requirement for effective, forward-deployed forces to carry out that mission. Technology made large numbers of inexpensive but extraordinarily destructive nuclear weapons available. A third domestic driver therefore was service rivalry—both between the services and even within them. Nuclear delivery became a priority mission, and each service—with the exception of the Marines Corps, which really never expressed much interest—wanted to contribute to that mission and, of course, to benefit from the enhanced access to resources that would accompany the new role.

By the late 1950s, the US Air Force had become the clear winner, controlling roughly half of the US defence budget.[15] In addition to the strategic bombing mission, the USAF was responsible for the land-based long-range missile force, tactical strike missions, and air defence interceptors (the US Army commanded the anti-aircraft missile weapons as part of the compromise on service missions reached at Key West in March 1948). Each of these mission areas competed for nuclear resources. The bomber fleet expanded from the B-29/50 propeller-driven aircraft to the gigantic B-36 (with mixed propeller-jet propulsion), and Strategic Air Command's inventory peaked in 1959 with over 1,800 jet bombers in service (B-47 and B-52).[16] The ICBM force included very large, liquid-fuelled Atlas and Titan missiles (with warheads in the 3–9 megaton range) with a range of smaller solid-fuelled missiles under development. US air defence interceptors were deployed with nuclear-tipped air-to-air missiles.[17]

The USAF was not the only service to pursue nuclear weapons, however. In the early 1950s, the Navy pursued long-range cruise missiles as a nuclear platform.[18] Later in the decade the USN began work on the Polaris submarine-launched ballistic missile (SLBM) programme, while simultaneously ensuring that new aircraft carriers had a substantial nuclear strike role—first with the A-3 and A-5 medium-range bombers, but later ensuring that even light strike aircraft like the A-4 were nuclear capable.[19] The air force and navy also developed smaller nuclear warheads for tactical use—for air defence and anti-submarine warfare in particular.

The army also developed nuclear weapons in response to internal requirements. The nuclear cannon gave way to dual-purpose artillery with nuclear shells, whose yield ranged from 0.1 kilotons (kT) to about 10 kilotons.[20] Battlefield and medium-range rockets were developed and deployed, and nuclear-tipped surface-to-air missiles (SAM) entered the army's inventory. The apex of this development was the

[15] See 'Budget Message: Eisenhower's Military Budget', *CQ Almanac 1958*, 14th ed., 11–580. Washington, D.C.: Congressional Quarterly, 1959. http://library.cqpress.com/cqalmanac/cqal58–1339938. The USAF received $18.4 billion in the 1957 budget, compared to $19.5 billion for the Army and Navy *combined*.

[16] The force strength for Strategic Air Command's Bomber Fleet can be found here: http://www.strategic-air-command.com/aircraft/bomber-graph/SAC%20Bomber%20Graph.htm.

[17] The W-25 1.7kT weapon was used on the 'Genii' air-to-air missile, and the 10kT W-40 was designed for the Bomarc Surface to Air Missile.

See http://www.nuclearweaponarchive.org/Usa/Weapons/Allbombs.html.

[18] David Miller, *The Cold War: A Military History* (New York, 1998), 110–16.

[19] *Ibid.*, 196–9.   [20] *Ibid.*, 438–9.

notorious 'Davy Crockett' mortar, whose nuclear payload had a blast radius that reportedly exceeded the actual range of the delivery system!

The final internal driver for the US was the emergence, during the Korean War, of what President Eisenhower later referred to as 'the military-industrial complex' (although he also included Congress as part of the problem).[21] The acceptance of Keynesian economics and the stimulating role of government spending coincided with massive American rearmament and the dedicated pursuit of scientific research and development for both commercial and military purposes. Universities accepted government funding to carry out scientific research, which was channelled towards military pursuits by an expanding high-technology manufacturing sector. Defence contracts were spread out carefully to maximize preservation and utilization of the defence industrial base.[22] Defence spending created 'spin-off' effects that increased the technological edge and competitiveness of the civilian economy. As a result, the arms competition provided an impetus both to technological innovation and to economic growth, which motivated Congress and the political leadership to maintain what were then unprecedented levels of peacetime defence spending, despite Eisenhower's prescient caution.[23]

External Drivers

Soviet foreign policy behaviour, at least partly because of its unpredictability, triggered the arms race and drove American competition. The Berlin Crisis of 1948–9 served to crystallize American concerns about Soviet intentions and reliability. The Korean invasion appeared to vindicate the militarized form of containment articulated in NSC-68, based on an assumption that government spending on defence would provide a Keynesian stimulus to the economy. The death of Stalin did not slow the arms race—in fact, Soviet deception tactics and bluffing actually encouraged American competition in the nuclear arena. The fears of bomber and missile gaps gained credibility because of Khrushchev's tendency to make nuclear threats over what appeared to be modest Soviet interests, including the 1956 Suez Crisis (which coincided with the Hungarian Revolt) and the Lebanon Crisis of 1958.[24]

In addition, NATO's inability to generate sufficient conventional forces to deter the Soviets reinforced a US inclination to rely on nuclear weapons as a substitute for conventional capabilities. Spectacular Soviet technological successes, including the Sputnik launch and the first intercontinental ballistic missile, enhanced US concerns about Soviet nuclear superiority. The combination of uncertain intentions,

[21] 'Eisenhower's Farewell Address to the Nation', 17 January 1961 at http://mcadams.posc.mu. edu/ike.htm. For Congress's role in the arms race, see the recent dissertation, Mark T. Esper, *The Role of Congress in the Development of the United States' Strategic Nuclear Forces, 1947–68,* George Washington University (UMI Dissertations Publishing, 2008).

[22] James R. Kurth, 'The Political Economy of Weapons Procurement: The Follow-on Imperative', *American Economic Review* 62/2 (May 1972), 304–11.

[23] James Ledbetter, *Unwarranted Influence: Dwight D. Eisenhower and the Military Industrial Complex* (New Haven, 2011).

[24] John Lewis Gaddis, *We Now Know: Rethinking Cold War History* (Oxford, 1997), 234–44.

demonstrated capabilities, and persistent use of bluff and bluster created an aura of Soviet superiority that was, in fact, unwarranted.[25]

The result was strong pressure to 'catch up' with demonstrated Soviet capabilities (Sputnik, jet bombers) *and* to use nuclear weapons to counter Soviet conventional advantages. The latter policy involved fundamental changes in nuclear command and control, drove the nuclear stockpile to enormous numbers, and contributed both to alliance tensions and the nuclear proliferation debate. The result, however, was that by 1960 the United States had a commanding lead in the nuclear arms race, in terms of destructiveness, survivability, and sheer quantity of delivery systems and warheads.[26]

REASSESSMENT: COMPETING DEMANDS AND RESOURCE CONSTRAINTS, 1960–1978

Although the 1960 presidential election actually occurred at the high point of US nuclear dominance, the debates between candidates John F. Kennedy and Richard M. Nixon included discussions of a 'missile gap' (which did not exist) and a space race, which President Kennedy pledged to win.[27] President Eisenhower's famous final address, however, warning of the dangers of a military-industrial (and Congressional) complex, was emblematic of the emergence of broader public disquiet about the massive surge in spending and the dangers of nuclear weapons. US nuclear modernization continued at a rapid pace during the Kennedy administration, but under his successor was already slowing.

One important element that affected resource allocation was the decision by the Kennedy administration to pursue a new policy of 'flexible response'. Rather than promising massive nuclear retaliation in any crisis—the implicit commitment of Eisenhower's 'New Look'—flexible response sought to provide the president with a range of escalatory options, including an enhanced conventional force that might—in theory—be effective enough to defer immediate nuclear use in a NATO–Soviet conflict.[28] Enhanced conventional forces, however, were expensive, and competed for resources with nuclear programmes. US strategic nuclear forces expanded rapidly through 1964, but modernization and continued procurement then began to decelerate.

[25] Pavel Podvig, 'The Window of Vulnerability That Wasn't: Soviet Military Buildup in the 1970s—A Research Note', *International Security* 33/1 (2008), 118–38.
[26] See Hans M. Christenson and Robert S. Norris, 'Global Nuclear Weapons Inventories, 1945–2013', *Bulletin of Atomic Scientists* 69/5 (2013), 78. The US had over 18,000 nuclear warheads; the Soviets had about 1,600. Available at http://bos.sagepub.com/content/69/5/75.full.pdf+html.
[27] Classified intelligence proved that the missile gap did not exist, but this could not be disclosed. Gaddis, *We Now Know*, 244–8. Cognitive bias played an important role in overestimating Soviet capabilities *and* in encouraging worst-case assumptions about Soviet intentions—see Jonathan Renshon, 'Assessing Capabilities in International Politics: Biased Overestimation and the Case of the Imaginary "Missile Gap"', *Journal of Strategic Studies* 32/1 (2009), 115–47.
[28] John Lewis Gaddis, *Strategies of Containment* revised and expanded edition (Oxford, 2005), 213–30; Ivo Daalder, *The Nature and Practice of Flexible Response: NATO Strategy and Theater Nuclear Forces since 1967* (New York, 1991).

Expanded conventional capabilities also allowed the US to consider intervention in regional conflicts on behalf of allies and potential partners. The US decision to intervene in Vietnam skewed commitment of defence resources away from nuclear assets. In addition, the decisions to wage that war with a conscript force, without mobilizing broad public support, and without raising taxes caused secondary impacts on the social and economic front that imposed severe constraints on US defence decision making in the 1970s. After the end of the Vietnam War, the US faced difficult choices between rebuilding conventional forces—including a new All-Volunteer Force—and modernizing nuclear systems.

A third internal driver was the deliberate decision by the US leadership not to increase the nuclear arsenal at the blistering pace of the late 1950s. The Kennedy administration began to question the open-ended expansion of the nuclear force, and created self-imposed limits on modernization and development of new systems.[29] Existing forces were phased out before their effective service lives expired (B-47, Atlas ICBM), new systems were curtailed or cancelled (B-58, XB-70), and new weapons for the bomber force (the Skybolt missile) were eliminated because of their cost.[30] The numbers deployed of emerging systems (Polaris, Minuteman) were capped. The administration was able to act in this fashion, in part, because of the lack of a rigorous revision to the Strategic Integrated Operational Plan (the American nuclear war plan), which would nominally have provided the basis for force-sizing decisions.[31] Some particularly bizarre tactical nuclear weapons were also withdrawn from service (Davy Crockett), but the number of warheads in the US inventory continued to expand until 1967, when it peaked at 31,255 (see Figure III.1).[32]

A fourth internal driver was the decision to divert further resources to active defence systems—the Nike-Zeus air defence missile, and later the Sentinel and Safeguard anti-ballistic missile projects. Initially viewed as a means of defending the US homeland against a Soviet nuclear attack, the scope and capacity of these projects were adapted to the harsh realities of technical limitations (each relied on atmospheric thermonuclear detonations to destroy their targets) and the growth of the Soviet missile arsenal. By the late 1960s, ballistic missile defence projects focused on defending key elements of the nuclear arsenal or defending the continental United States against a future Chinese strike, and continental air defence had been de-emphasized due to the Soviet ballistic missile threat.[33]

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[29] Alain C. Enthoven and Wayne K. Smith, *How Much Is Enough? Shaping the Defense Program 1961–1969* (Sant Monica: RAND, 1971) at http://www.rand.org/content/dam/rand/pubs/commercial_books/2010/RAND_CB403.pdf. See also Desmond Ball, *Politics and Force Levels: The Strategic Missile Programs of the Kennedy Administration* (Berkeley CA, 1980).

[30] Friedman, *The Fifty-Year War*, 291.

[31] The original US Navy demand was for forty-five Polaris submarines, eventually reduced to forty-one. The US Air Force demands for Minuteman ICBM forces ranged from 900 to 10,000, eventually being settled at 1,000. See Robert P. Haffa, *Rational Methods, Prudent Choices: Planning U.S. Forces* (Fort McNair, Washington, D.C., 1988), 24–7.

[32] Hans M. Christenson and Robert S. Norris, 'Global Nuclear Weapons Inventories, 1945–2013', *Bulletin of Atomic Scientists* 69/5 (2013).

[33] *History of Strategic Air and Ballistic Missile Defense: Volume II, 1956–1972*, pp. 54–9 at http://www.history.army.mil/html/books/bmd/BMDV2.pdf.

A final internal driver was a change in the way nuclear weapons were viewed by the political leadership, the US public, and by the academics and analysts who played a key role in determining nuclear strategy. In the 1960s, for the first time, public pressure began to affect government policy on nuclear tests, nuclear proliferation, and even nuclear forces and strategy. Films like *Dr. Strangelove* and *Failsafe* exposed the public to the possibilities of accidental nuclear war, and *Thunderball* raised the possibility of nuclear weapons being possessed by a non-state actor [!]. The 1961 Berlin Crisis and the 1962 Cuban Missile Crisis demonstrated that nuclear war between the superpowers was a real possibility, one that would have devastating consequences.[34] Analysts and policy makers struggled with the problem of what 'victory' would mean in an all-out nuclear war, and began re-examining the logic of deterrence. Two key concepts—mutual assured destruction (MAD) and the stability-instability paradox—emerged from this period.[35] Each affected nuclear policy and procurement, helping to explain a shift from seeking war-fighting capabilities and superiority to a gradual acceptance of sufficiency and assured second-strike forces. This shift in policy contributed to the slowing of nuclear modernization on the US side, and to increasing criticism of new systems which might support a war-fighting strategy.

During this period, arms control negotiations were initiated with the Soviet Union—an important policy initiative.[36] These arms control efforts played an increasingly important role in the arms race. Initial arms control efforts focused on nuclear testing and on proliferation concerns.[37] The Interim Strategic Arms Limitation Treaty (SALT I) and the Anti-Ballistic Missile (ABM) treaty, both signed in 1972, resulted from negotiations to put quantitative and qualitative limits on the offensive and defensive arsenals of both sides after the Soviets reached relative parity in numbers of launchers—and in the face of increasing Congressional pressure to lower defence spending. The talks locked asymmetric forces in place on each side that would determine the contours of the arms race in the final stages of the Cold War.

Technological change also played an important role in this period. The emergence, early in the 1960s, of advanced surface-to-air missile systems challenged the utility of the manned bomber aircraft—a mainstay of the US nuclear force. Some Secretaries of Defence (McNamara) believed this rendered the manned bomber component of the nuclear triad too expensive. The SLBM provided a

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[34] Marc Trachtenberg, *History & Strategy* (Princeton NJ, 1991), 169–260.

[35] Secretary of Defense Robert McNamara's gradual decision to shift from a 'non-cities' doctrine of nuclear warfighting to a deterrent capability enabling destruction of enemy societies—the 'Mutual Assured Destruction' concept—is detailed in his official biography at http://www.defense.gov/specials/secdef_histories/SecDef_08.aspx. Glen Snyder's development of the concept of a 'stability-instability paradox' brought about by large nuclear arsenals helped explain how nuclear deterrence makes large conventional wars less likely, but also how those arsenals may actually encourage risk taking at lower levels of conflict.

[36] The logic of using arms control this way is explained by its architect in Henry Kissinger, *Diplomacy* (New York, 1994), 714–17 and 745–52.

[37] The results of these efforts were the Partial Test Ban Treaty (1963) and the Nuclear Non-Proliferation Treaty (1968), both of which remain in effect. The former restricted various types of nuclear testing (especially in the atmosphere), and the latter remains the basis for nonproliferation and nuclear disarmament efforts today.

secure second-strike capability—a core mission under emerging theories of nuclear deterrence and stability. The costs and limited effectiveness of first-generation BMD systems accentuated the vulnerability of facilities and populations to nuclear-armed missiles.[38] The development of solid fuel propulsion for missiles increased flexibility and survivability, and encouraged the application of concepts like launch on warning and launch under attack—which contributed to perceptions of vulnerability and uncertainty that played a role in the arms race in the 1980s.

Two key developments late in this period—multiple independently targetable re-entry vehicles (i.e. warheads) or MIRVs, and highly accurate cruise missiles—became critical elements of US nuclear strategy. Possession of MIRV capability allowed the US to accept lower levels of ICBMs in early arms control negotiations, based on the optimistic assumption that the Soviets would not be able to catch up quickly.[39] MIRVs also complicated the task of active missile defence—each incoming missile might have as many as fourteen warheads.[40] Accurate cruise missiles reinvigorated the utility of long-range bomber aircraft, by increasing survivability and allowing each individual bomber to reach a much wider geographical range of targets—severely complicating the problem of air defences. Both technologies became the focus of later arms limitation efforts, as the restricted scope of the initial SALT agreements became apparent. The increasing accuracy of both types of system contributed to anxieties about the vulnerability of land-based forces and facilities, and MIRVs in particular raised fears that limited nuclear strikes could pre-emptively eliminate America's land-based nuclear forces.

A final internal contributor to the arms race was the desire to maintain the defence industrial base, for a combination of economic, political, and national security reasons. Through the 1960s, defence procurement appeared to be apportioned to ensure that major companies each received some share of the business.[41] The decline in the number of systems being procured contributed to industrial contraction, but producers recognized the value of spreading manufacturing facilities and subcontracting components throughout the US, reaching the logical extreme when Rockwell ensured that the B-1 strategic bomber programme had contracts in virtually every one of the fifty states.

External Factors

External factors contributed comparatively more to the arms race in this middle period than in 1945 to 1960. This shift occurred because Soviet capabilities became

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[38] Early BMD systems relied on detonations of high-yield thermonuclear warheads to intercept incoming weapons—a concept that was particularly problematic for the defence of urban areas. See, for example, the W-65 (MT range) and W-66 (kT range) warheads for the Sprint, and the W-71 (5 MT) warhead designed for the longer-range, exo-atmospheric Spartan interceptor. Source: http://www.nuclearweaponarchive.org/Usa/Weapons/Allbombs.html.

[39] Kissinger notes that the US had voluntarily capped its strategic offensive forces in 1967. *Diplomacy*, 748–50.

[40] On the development of MIRVs, see Ted Greenwood, *Making the MIRV: A Study of Defense Decision Making* (Cambridge, MA: Ballinger, 1975) and Donald MacKenzie, *Inventing Accuracy: A Historical Sociology of Nuclear Missile Guidance* (Cambridge, MA, 1990).

[41] Kurth, 'The Political Economy of Weapons Procurement'.

relatively more transparent due to satellite and electronic intelligence and also as a result of data the superpowers exchanged as part of arms control negotiations. The Soviet ICBM force expanded from fewer than a dozen launchers in 1960 to 226 in 1965 and 1,434 in 1970, while by the late 1970s older SS-6/7/9 ICBMs had been replaced by much more capable SS-17/18/19 weapons. Soviet land-based missiles were usually liquid fuelled, larger, and had greater 'throw-weight' than US systems, creating the option to deploy larger numbers of more powerful MIRVs as the Soviets mastered that technology.[42]

Soviet nuclear modernization efforts in other areas seemed equally threatening. The Soviet SLBM force expanded from zero (1960) to over 700 (1975). The new SS-N-8 SLBM had almost three times the range of the older SS-N-6, and by 1980 the SS-N-18, with ten MIRVs per missile and an extended range, was also entering service in large numbers.[43] Theatre missiles in Europe had stagnated for much of this period, but this set the stage for a crisis in the late 1970s. The new SS-20 inter-mediate range ballistic missile (IRBM), armed with three accurate MIRVs, was much more capable than the elderly SS-4 and SS-5 missiles it replaced. Similarly, the new Tu-22M 'Backfire' bomber, which could be used for both conventional and nuclear missions, was far more capable than the older Tu-16s and Tu-95s that preceded it, and became a particular problem in the SALT II negotiations held during the Carter administration.

The non-ratification of the 1979 SALT II Treaty marks the end of this period of the Cold War. The pace of the Soviets' strategic modernization, and the rapid deployment of accurate MIRVs on their ICBM force in particular, called the entire arms control process into question. SALT II capped the numbers of delivery vehicles on both sides, and imposed limits on the numbers of warheads each could carry. Critics believed it also locked the US into an increasingly dangerous strategic position. The controversial 'Team B' report was prepared by a group of scholars and analysts critical of the prevailing assumptions held by the US intelligence community.[44] It attacked both arms control and the policy of détente, noting that two legs of the US nuclear 'triad'—land-based ICBMs and strategic bombers—could be held at risk by the heavy SS-18 ICBMs (with ten MIRVs per missile), which constituted only about 20 per cent of the USSR's ICBM force. Soviet nuclear strategy continued to focus on nuclear war-fighting and early nuclear use in the event of war with NATO.[45] Finally, Soviet intentions became increasingly suspect, with American suspicions peaking in 1979 after the public revelation of a Soviet combat brigade (actually long since present) in Cuba and the Soviet intervention in Afghanistan.

[42] Pavel Podvig et al. eds., *Russian Strategic Nuclear* Forces (Cambridge, MA, 2001), 136–7, cited in Sergey Radchenko, 'The Soviet Union and the Arms Race' in this volume; John M. Collins, *U.S.-Soviet Military Balance: Concepts and Capabilities 1960–1980* (New York, 1980), 442–60.

[43] Miller, *The Cold War*, 422–3.

[44] Kissinger caustically refers to the growing attacks on arms control, which ignored the fact that the armed services were not asking for increases in force structure, but only modernization. *Diplomacy*, 749. For an alternate view, see Friedman, *The Fifty-Year War*, 418–20. Cf. also Anne Cahn, *Killing Détente: the Right Attacks the CIA* (State College PA, 1998).

[45] Tom Nichols, *Winning the World* (Westport CT, 2002), 119.

ARMS RACE RENEWED, 1979–1990

The re-emergence of the US–Soviet nuclear arms race became a major factor in domestic and international politics in the 1980s. The opening moves came at the end of the Carter administration, with the decision to deploy modern intermediate-range nuclear forces in Western Europe. This decision drew significant political opposition in Europe, including the famous 'Greenham Common' protests in the United Kingdom.[46] It also eventually placed highly accurate and lethal Pershing II missiles just a few minutes' flight time from Soviet nuclear command and control facilities in the Moscow area.

Soviet policy in the late 1970s appeared to reflect a more aggressive Soviet policy towards the developing world. In response, the Carter administration significantly increased defence spending after the Soviet invasion of Afghanistan. This included a commitment to deploy limited numbers of the very accurate MX missile, which replaced the elderly Titan II. The Reagan administration was elected on a promise to restore US military might, and continuing budget increases allowed massive modernization in nuclear forces. The B-1 bomber programme was restored and Trident submarines with increasingly accurate missiles deployed as a replacement for the older Polaris and Poseidon systems. The later D-5 variant of the Trident at least theoretically had the accuracy and lethality to target Soviet ICBM silos and other hardened sites—the first time the US Navy had deployed a ballistic missile with counterforce capability.[47] The older Minuteman III was upgraded with new, more lethal MIRVs, and large numbers of new air and sea-launched cruise missiles were deployed.[48]

Equally important was the public discussion of new nuclear doctrine. Under President Carter, Presidential Directive 59 stated that the US would seek to prevail in a nuclear conflict, although without defining what victory might look like.[49] This decision moved the US away from MAD as the basis of force planning and nuclear strategy, again articulating the need for pre-planning operational concepts and possibly fighting a protracted nuclear war. Under the Reagan administration, the commitment to victory in a nuclear war continued, and the US government took steps to increase the viability of that strategy, which was challenged by a growing public opposition to commercial nuclear energy and the nuclear arms race. This public apprehension was also manifested in the media: *The Day After*, a television film that depicted a US–Soviet nuclear exchange and its aftermath, had a powerful emotional impact on both public and policy makers.[50]

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[46] Kissinger, *Diplomacy*, 775–8; Timothy McDonnell, ed, *The Euromissiles Crisis and the End of the Cold War, 1977–1987* (Cold War International History Project, Washington D.C., 2009).

[47] Donald MacKenzie, *Inventing Accuracy: A Historical Sociology of Nuclear Missile Guidance* (Cambridge, 1993).

[48] The outcome of this modernization programme is captured by Miller, *The Cold War*, 424. The number of theoretically useable counterforce MIRVs on the US ICBM/SLBM legs of the nuclear triad increased from 900 to over 2,300 by 1990, including the emerging D-5.

[49] The recently declassified PD-59 is now available at http://www2.gwu.edu/~nsarchiv/nukevault/ebb390/, as document #8.

[50] Nichols, *Winning the World*, 190–4.

Public and private concerns about the arms race, and the apparent promise of emerging technology, combined to create a new policy initiative. In a famous speech in 1983, President Reagan announced the decision to develop the Strategic Defence Initiative (SDI), a ballistic missile defence system based on as-yet untested technologies that would include a space-based component.[51] President Reagan argued that missile defences were inherently more moral than relying on mass destruction as a means of deterring nuclear war, suggested they would be an effective hedge against accidental nuclear launch or mistakes (an increasing concern in this period), and even offered to share the technology with the Soviets once it was developed.

This programme, promptly dubbed 'Star Wars' by the press, became controversial in both the US and the USSR. Within the US, critics assailed the programme as expensive and deeply optimistic, based as it was on technologies and computing systems that did not yet exist. The US commercial information industry, however, was thriving, and the combination of government R&D funding and emerging developments in computing and electronics offered great promise. The Soviets were alarmed by the new programme, which they feared would limit the strategic leverage of their expensive ICBM force. The Soviets also recognized that they would be unable to replicate SDI—they lacked the resources and the technology.

The impact of US technological developments on Soviet planning and strategy cannot be underestimated. Unlike the 1950s, when the Soviets had succeeded in achieving technological breakthroughs and surprises in the arms race (from their unexpectedly early development of both atomic and thermonuclear weapons to innovation in rocket and satellite technology), by the 1970s Soviet military analysts were recognizing technology as an area of American advantage. The writings of Marshal Nikolai Ogarkov (chief of the Soviet general staff from 1977 to 1984) predicted the imminent development of accurate and sophisticated long-range conventional strike systems that would have nuclear-like effects.[52] A decades-long technology denial regime based on the policy of containment and exemplified by regimes like the Coordinating Committee (COCOM) had helped the West create and preserve a significant advantage in emerging information technologies. US advantages in electronics, in space systems, and in computing were all viewed with alarm, and new technologies like low-visibility 'stealth' aircraft promised to undermine massive Soviet investments in air defences.[53]

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[51] President Ronald W. Reagan, 'Address to the Nation on National Security', 23 March 1983 at http://www.reagan.utexas.edu/archives/speeches/1983/32383d.htm.

[52] See, for example, Colonel General N. A. Lomov, ed., *Scientific-Technical Progress and the Revolution in Military Affairs* (Washington D.C., 1973). See also John A. Battilega, 'Soviet Military Thought and the U.S. Competitive Strategies Initiative', in Thomas G. Mahnken, ed., *Competitive Strategies for the 21st Century: Theory, History, and Practice* (Stanford CA, 2012), 106–27.

[53] These changes were noted in the 1970s, and became the basis for the 'competitive strategies' approach that was actively encouraged by the Office of Net Assessment. The first significant US writing on this subject is Andrew W. Marshall, *Long-Term Competition with the Soviets: A Framework for Strategic Analysis* RAND R-862-PR (Santa Monica: RAND, April 1972) available at http://www.scribd.com/doc/244175986/Marshall-1972-Long-Term-Competition#scribd.

US modernization programmes and nuclear strategy capitalized on Soviet fears. The US Navy's new maritime strategy took advantage of covert intelligence to target the Red Navy's protective bastions in the Arctic and the Sea of Okhotsk.[54] These bastions held Soviet nuclear reserves—the submarine-launched ballistic missile force—and the new strategy utilized superior US submarine technology to hold those Soviet submarines at risk. The US strategic bomber force, using modernized B-52s armed with cruise missiles as well as the new B-1 and stealthy B-2, created new threats that forced the Soviets to make expensive investments to revitalize their air defence forces.[55] The revitalized ballistic missile forces, including the Trident D-5, added thousands of new counter-force-capable warheads to the US strategic arsenal, putting Soviet land-based ballistic missiles at risk. SDI promised to re-invent the concept of ballistic missile defence, and to erode the strategic leverage of the Soviet heavy ICBM arsenal.

The Soviets attempted, unsuccessfully, to use 'soft power' to overcome these threatening US developments. Efforts to influence Western European public rejection of intermediate range force modernization were persistent but primitive. International opinion increasingly turned against the USSR. Soviet intervention in Afghanistan alienated former supporters in the Islamic world. Soviet air defences shot down a South Korean passenger aircraft over Soviet territory in 1983, claiming it was an intelligence aircraft, and in the same year Margaret Thatcher and Helmut Kohl, who supported cruise- and Pershing II-missile deployments, won crucial election victories in Britain and Germany. The Reagan administration developed a very effective information attack on the Soviets in the form of the annual publication *Soviet Military Power*, which highlighted Soviet capabilities and intentions even as the Soviets launched a 'peace offensive' in the press.[56]

As a result of all these developments the Soviets re-examined their own strategy and nuclear forces, their available resources, and the other methods available of influencing what they saw as their deteriorating strategic position. Given the lack of results in other directions, the Soviets turned to arms control—rather as the US had in the 1960s—as a means of managing the most destabilizing elements of US strategic modernization. The Intermediate Nuclear Force negotiations, following the 1986 summit discussions between Reagan and Mikhail Gorbachev at Reykjavik

[54] Christopher A. Ford and David A. Rosenberg, 'The Naval Intelligence Underpinnings of Reagan's Maritime Strategy', *The Journal of Strategic Studies* 28/2 (2005), 379–409. For some of the documentation surrounding the US Navy's maritime strategy in the 1980s, see John B. Hattendorf and Peter M. Swartz, eds., *U.S. Naval Strategy in the 1980s: Selected Documents*, Newport Papers 33 (Newport RI, 2008). Some of the issues raised in the 1980s surrounding the Soviet bastion concept are discussed in Donald C. Daniel, *Anti-Submarine Warfare and Superpower Strategic Stability* (Urbana-Champagn IL, 1986).

[55] Gordon Barrass, 'U.S. Competitive Strategy During the Cold War', in Thomas G. Mahnken, ed., *Competitive Strategies for the 21st Century: Theory, History, and Practice* (Stanford CA, 2012), 78–81.

[56] Some of the chapters of various editions of *Soviet Military Power* can be found at http://www.fas.org/irp/dia/product/smp_index.htm. See also James Graham Wilson, *The Triumph of Improvisation: Gorbachev's Adaptability, Reagan's Engagement, and the End of the Cold War* (New York, 2013).

which suggested that a future without nuclear weapons might be an outcome both sides desired, created a perception on both sides of greater stability and rationality.[57] The Conventional Armed Forces Europe (CFE) talks grappled with limiting the conventional forces of both the Warsaw Pact and NATO.[58] This had the effect of reducing demand for tactical nuclear weapons to redress the conventional imbalance. Finally, the US and Soviets resumed strategic arms control talks, eventually leading to the 1991 Strategic Arms Reduction Treaty (START). This easing of the arms race and search for greater stability continued even after the end of the Cold War and the collapse of the Soviet Union.

The key drivers of the US side of the arms race in this period were less complex than in previous periods, partly because this last stage was fairly short (the crucial years were 1979–84). The key internal driver was the availability of increased defence budgets. The US simultaneously modernized all three elements of the nuclear triad—new Trident submarines and missiles for the Navy, new MX missiles and upgraded Minuteman III warheads for the ICBM force, and the B-1 and B-2 bombers for the strategic bomber force. Abundant resources meant that hard choices could be avoided, at least for a time. They also meant that conventional and nuclear forces could be modernized simultaneously, creating multiple problems for Soviet defence planners.[59]

A second critical driver was the perception of Soviet intentions. The idea of arms control gained credibility during the 1960s and early 1970s, when the Soviets' capabilities increased but their actions suggested opportunities for compromise, crisis management, and cooperation. Renewed Soviet aggressiveness, particularly in Afghanistan, created a backlash in the US. Defence budgets expanded dramatically in response, and American leaders began thinking once again about winning, rather than managing, both the arms race and the associated geopolitical competition. US success was enabled by Soviet economic weakness and a crisis in leadership. George Kennan had predicted both, but it took forty-five years for the Soviet economic system to implode and for the Communist Party to destroy the credibility it had gained by surviving and winning the Great Patriotic War.

CONCLUSION

The term 'arms race' suggests a short, competitive, action-reaction cycle between two evenly matched opponents, which one eventually 'wins'—either through securing an indisputable superiority (avoiding war) or by demonstrating that

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[57] Nichols, *Winning the World*, 213–17; Friedman, *The Fifty-Year War*, 470–2.
[58] See *Treaty on Conventional Armed Forces in Europe*, 19 November 1990, at http://www.osce.org/library/14087.
[59] See, for example, the 1986 version of FM 100–5 Operations, also known as the US Army's Air–Land Battle Doctrine, available at http://cgsc.contentdm.oclc.org/cdm/ref/collection/p4013coll9/id/893.

superiority *in* war. Not all the arms races in this book actually follow that format, however, and the Cold War arms race is perhaps the most problematic.

The Cold War arms race was more of a marathon than a sprint—a generation-long competition with significant lags in the action-reaction cycle. Asymmetries were critical throughout the competition—the US used nuclear weapons to compensate for NATO's conventional weakness, the Soviets used missiles to compensate for lack of long-range aviation, and the two sides even used similar ballistic missile submarines in distinctly different strategic roles. Technological change played a crucial part, as the development of new warheads and delivery systems and the unrealized promise of active defences forced each side to adapt to emerging challenges. Each side was forced to recognize economic constraints, and each tried to use diplomacy to manage the competition when the costs of competing became unmanageable.

The US side of the Cold War arms race was driven primarily by two *external* factors—concerns over the conventional imbalance with the Soviet Union, which drove an early commitment to nuclear weapons as a countermeasure, and then perceptions of the Soviet response to that US build-up after the Cuban Missile Crisis. These factors are powerful explanations for the two periods—1950–60 and 1979–84—when the modernization and expansion of the US nuclear arsenal received the highest priority. Nuclear weapons were developed for both practical use and symbolic value, but the struggle to find ways to use them as effective military instruments was never fully resolved. Their dubious tactical military benefits were far outweighed by the risks of escalation and the possibility of devastating homeland strikes.

Key decisions in the development of US nuclear forces, however, were dominated by *internal* factors. Inter-service rivalry played an important role—SLBM programmes were driven by navy interests, not Soviet developments or a broader strategy, and the role of manned bombers remained contested throughout the Cold War. Uncertainty about the utility of nuclear weapons meant that each service independently developed a range of nuclear systems. This profligacy was facilitated by high levels of defence spending and public support—overlapping nuclear capability was rarely controversial—and by concerns for maintenance of the defence industrial base and R&D capabilities. Efforts to link procurement to strategy or diplomacy were often tenuous, and the Soviets were naturally as dubious about US rhetoric as the US was about communist protestations of peaceful intent.

The strategic theories derived from the Cold War arms race, and the legacy of the arsenals still fielded by the US, Russia, Britain, and France, remain relevant today in a new period of nuclear proliferation. The 'lessons' of the Cold War arms race, and their transferability to other arms races in the twenty-first century, are more problematic.[60] The US and Soviet Union viewed the Cold War through the lens of the Second World War, during which entire societies were mobilized and

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[60] See, for example, Toshi Yoshihara and James R. Holmes, eds., *Strategy in the Second Nuclear Age: Power, Ambition, and the Ultimate Weapon* (Washington, D.C., 2012); and Paul Bracken, *The Second Nuclear Age: Strategy, Danger, and the New Power Politics* (New York, 2012).

genocide and area bombing challenged the principle of non-combatant immunity. Both sides, particularly after 1950, mobilized industry and society—including academia—for war, and devoted unprecedented funding to procurement and R&D. The closest twenty-first-century parallel is the relationship between India and Pakistan, countries which, despite decades of hostility and mutually incompatible political foundations, have so far pursued their own nuclear arms competition in a more measured manner.

India's nuclear development has been driven by its civilian political leadership, scientific community and the state-run Defence Research and Development Organization. Each exerts pressures for nuclear development, but also imposes constraints on deployment. India's unique civil-military relationship imposes enormous restrictions on the military's role in procurement, deployment, and command and control, but each of the services still desires a role in India's nuclear capability.

In Pakistan, by contrast, the role of the army overshadows any other element of the Pakistani government and establishment. The nuclear-weapons programme represents the single most important symbol of Pakistani national identity and strategic relevance. Pakistan is producing fissile material as quickly as it can, and apparently inducting weapons as quickly as possible into its arsenal. Nevertheless, the innate limits of Pakistan's economy and industrial base impose profound constraints on the country's ability to imitate the dramatic US nuclear build-ups of the 1950s or early 1980s. The India–Pakistan arms race demonstrates many of the same elements as the Cold War arms race—it too has been a long-term competition, with significant lags in the action-reaction cycle. The pace of the nuclear competition, however, remains much less frenetic than during the US–Soviet conflict, despite the mutual antipathy and irreconcilable world views of the two states. This may suggest, for students of the arms racing phenomenon more generally, that the internal drivers within the competing states may fundamentally matter more in explaining outcomes than does the external security environment.

7

The Soviet Union and the
Cold War Arms Race

Sergey Radchenko

'One should move decisively, with the investment of decidedly all means…' Portraits of Lenin and the tsar's generals looked solemnly from the walls as Joseph Stalin elaborated his vision of the Soviet atomic project. The project's scientific head, Igor Kurchatov, who had been invited to the high audience on this bleak evening of 25 January 1946, knew first-hand how much Stalin would do for the Bomb: in the months since Hiroshima the Soviet industry had gone into full gear to find, extract, and process fission material, and to build that very first weapon that would shatter America's atomic monopoly.[1] Three and a half years later, Kurchatov's frenetic efforts paid off, and Stalin's hope of redressing the 'equilibrium' upset at Hiroshima was at last fulfilled. The atomic mushroom at the Semipalatinsk testing range on 29 August 1949 cast a long shadow over world politics. The Cold War now assumed a new dimension—a nuclear arms race—that would redefine the character of this conflict and, in many ways, determine its ultimate outcome.

This chapter offers a brief account of the Soviet Union's participation in the Cold War arms race from Stalin to Gorbachev. It looks at the interplay between technological developments and the evolution of Soviet foreign policy. The focus here is largely on nuclear weapons. True, the Soviet–American arms race was not confined solely to nuclear weapons. It was a multidimensional phenomenon, encompassing conventional weaponry, as well as biological and chemical weapons, and their means of delivery, computing technologies, reconnaissance, etc. Indeed, breakthroughs in one of these spheres often spurred new rounds of competition in other spheres. Still, the Bomb came to symbolize the arms race with all of its associated costs, dangers, and absurdities. Nuclear weapons altered the very character of war, forcing dramatic changes in the military doctrines of both the Soviet Union and the United States. The Bomb's horrifying capacity for indiscriminate destruction outweighed ideological disagreements and the personal proclivities of the leaders of the two superpowers and finally brought them to the negotiating table, helping to lead to the end of the Cold War.

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[1] Yurii Smirnov, 'Stalin i atomnaya bomba', *Vestnik Instituta Istorii Estestvoznaniya i Tekhniki*, 2 (1994), 128–9.

It took time before the full psychological weight of a nuclear apocalypse made its impact on policy making. For the Soviet Union, the nuclear arms race began as an issue of state prestige: the Bomb was perceived as a *sine qua non* of great-power status. The race intensified under Nikita Khrushchev, who developed an appetite for nuclear-tipped missiles as a cost-effective quick fix for Moscow's security concerns and a proof of the Soviet Union's technological edge. Yet it was also Khrushchev who also pursued arms control agreements for their own sake rather than merely as a propaganda ploy, especially after he came face to face with the prospect of a nuclear war during the Cuban Missile Crisis. Khrushchev's successor Leonid Brezhnev saw in nuclear weapons his trump card for achieving much-wanted equality with the United States, a basis for détente. Unfortunately, the nuclear balance reached in the early 1970s was intrinsically unstable, and détente constructed upon the threat of mutual destruction proved short-lived.

FROM STATUS SYMBOL TO MEANS OF WAR FIGHTING

Stalin once said that it was armies, not weapons, that decided the outcome of wars.[2] These sorts of statements must of course be taken with a grain of salt: the Soviet Union would not have committed the kind of massive effort that it did to obtain the Bomb if Stalin thought that it was just 'another weapon'. There is, however, some truth to the assertion that at the outset Stalin did not see the Bomb as an effective military weapon so much as a symbol. It was an attribute of a great power, like, for instance, battleships—another pet project of the late-Stalin years that had marginal military utility for a land power but that glittered in glory, projecting a sense of unassailable prestige and raw might. Stalin asked Kurchatov in January 1946 to 'carry out the work quickly, and in the crude basic manner'.[3] He did not want tricky design improvements, or claims to scientific originality, just something to demonstrate that the Soviet Union, too, was a nuclear-armed power that did not fear Washington's blackmail.

The Soviet leader was painfully aware of the psychological advantages conferred by the Bomb; its very existence was a threat to which Stalin responded with bluff and bravado. Soviet assertiveness in post-war negotiations with Washington was at least in part an effort to counter this implicit but real threat with a display of 'adamancy' that the Allies mistook for expansionist plans. 'Stand firm and make no concessions to the Allies,' Stalin cabled his lieutenant Vyacheslav Molotov on 12 September 1945, ordering him to take a tough line at a meeting of the Council of Foreign Ministers in London.[4] Even a minor compromise could give the impression of yielding before nuclear threats. Molotov did as he was told, and on subsequent

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[2] Andrzej Werblan, 'New Evidence on Poland in the Early Cold War', *Cold War International History Project Bulletin* 11 (Winter 1998), 134–40. Translated by Anna Elliot-Zielenska.

[3] Yurii Smirnov, 'Stalin i atomnaya bomba', 128.

[4] Vladimir Pechatnov, 'The Allies are pressing on you to break your will…', *Cold War International History Project Working Paper*, No. 26 (1999), 2.

occasions, as in October 1946, even claimed publicly that the Soviet Union was already a nuclear power, and had even more powerful weapons than that: 'My, you are strong!' commented Stalin on this performance.[5] The Soviet breakthrough at Semipalatinsk would render such a masquerade unnecessary.

On 30 August 1949 Kurchatov and the Soviet security tsar Lavrentii Beria submitted a joint report to Stalin, detailing the devastation wrought at the testing site: buildings were levelled; tanks thrown about; animals burned or subjected to lethal doses of radiation. Stalin received Beria and other officials of the Soviet A-bomb project two days later to get a first-hand report on the test. He appeared both happy about the success of the effort and also sceptical about the extent of the reported damage, asking several times whether his visitors had in fact witnessed the events they were describing.[6] The evidence, however, was overwhelming. For all of Stalin's initial scepticism, the Bomb was not just any weapon. It was a weapon that possessed, in the words of the Beria–Kurchatov report, 'exceptionally destructive force,' and, judging by the decapitated tanks and mangled military infrastructure of the testing site, it could be effectively deployed in battle.[7] Suddenly, the question was no longer whether the Soviet Union possessed the A-bomb or not, but how many, and how powerful.

The radioactive dust had not yet settled on the wind-swept Kazakh steppe when, on 18 November 1949 the Soviet leadership resolved to organize serial production of the plutonium bomb, and store such devices and all their accessories in a manner that would permit their 'use in battle'. Before the year was out, two more bombs were constructed, and another nine were added to the arsenal in 1950 (as against the planned target of seven). By early 1951 the Soviet Air Force had re-equipped seven Tu-4 bombers to carry atomic payloads, and had trained crews in their use.[8] At that point the Americans had more than thirty of their own for every one of the Soviet bombs but even the few bombs that Stalin now possessed added up, in his view, to a powerful deterrent and boosted the ageing dictator's confidence. This renewed sense of confidence may have played into his decision, in January–February 1950, to agree to a new treaty of alliance with communist China, and move towards approval of Kim Il Sung's invasion of South Korea. The latter misadventure unexpectedly resulted in US intervention but, Stalin thought, it was only for the better: the Americans were stuck in a quagmire, and would not risk a

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[5] Cited in Campbell Craig and Sergey Radchenko, *The Atomic Bomb and the Origins of the Cold War* (New Haven CT, 2008), 144.

[6] Mikhail Pervukhin, 'Kak byla reshena atomnaya problema v nashei strane', *Novaya i Noveishaya Istoriia* 5 (2001), 135.

[7] Report from L. P. Beria and I. V. Kurchatov to I. V. Stalin about preliminary data obtained during the test of the atomic bomb, 30 August 1949, in L. D. Ryabev et al., *Atomnyi Proekt SSSR*, Vol. 2–1 (Sarov: RFYaTs-VNIIEF, 1999), pp. 639–43.

[8] Report from L. P. Beria to I. V. Stalin about the course of the implementation of the government's tasks with respect to the development of the atomic industry, 26 March 1951, in L. D. Ryabev et al., *Atomnyi Proekt SSSR*, Vol. 2–5 (Sarov: RFYaTs-VNIIEF, 2005), pp. 665–8. Notably, Beria's data on the Soviet atomic stocks are in considerable excess of the well-known estimates found in many a Western comparative study of the Soviet atomic project, for example: http://csis.org/files/media/csis/pubs/poni/global_nuclear_stockpiles.pdf.

still bigger war. As he said, with evident satisfaction, in January 1951: 'The US has atomic power; we have that, too.'[9]

The news of the Soviet atomic blast at Semipalatinsk spurred President Truman to lend his support to research on the hydrogen bomb, despite considerable resistance in the scientific community.[10] The US military believed that it was a matter of life and death for the United States to field the H-bomb—if it could be fielded—before the Russians got to it: 'the United States', argued the joint chiefs of staff in a report—'would be in an intolerable position if a possible enemy possessed the Bomb and the United States did not...'[11] But the same logic applied for the Soviet leadership. The Soviets were aware of the theoretical possibility of the 'super': work on nuclear fusion was authorized as early as June 1948. This was in reaction to intelligence, supplied by Klaus Fuchs, that the Americans were discussing this prospect.[12] But it was only after Truman's announcement of the H-bomb project at the end of January 1950 that Lavrentii Beria wrote to Stalin (on 26 February), urging his boss, despite all difficulties, to pursue the 'super.' Beria's argumentation was quite similar to that of the US joint chiefs of staff: 'considering that our enemies may get their hands on a new and fairly effective weapon, we consider it necessary and possible [to build the H-bomb].'[13] Stalin approved these plans on the same day, and the Soviet Union tested its first 'proper' thermonuclear bomb in November 1955. It was a hundred times more powerful than the one detonated at Semipalatinsk six years earlier. This thermonuclear debut coincided with the beginning of the serial production of turboprop Tu-95 and jet-engine 3M strategic bombers, which afforded the Soviet Air Force the capability to strike and destroy practically any target inside the United States.

Much more than a status symbol, these new weapons were becoming central to the Soviet military doctrine. By the mid-1950s, Soviet generals worked out war scenarios that would involve big moves by large armies upon great battlefields, just like in the Second World War, except that these armies would move through a radioactive haze over nuclear battlefields. The Soviet Army conducted military exercises with the use of nuclear bombs in September 1954 at Totskoe and in September 1956 at Semipalatinsk, and by the end of the decade the Soviet general staff took it for granted that should a war break out, say, in Europe, it would be a nuclear war. This thinking was personified by Soviet Minister of Defence Georgii Zhukov, a keen enthusiast for nuclear warfare. Zhukov refuted claims that nuclear weapons changed the very character of war. 'The biggest known destructive weapons,' he explained in March 1957, 'can devastate only an area of 3 kms radius which is

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[9] C. Cristescu, 'Ianuarie 1951: Stalin decide înarmarea Romanei', *Magazin Istoric* 10 (1995), 15–23. Translated by Vladimir Socor.

[10] Richard Rhodes, *Dark Sun: the Making of the Hydrogen Bomb* (New York, 2005), 407.

[11] *Ibid.,* 406.

[12] There is a lively debate in the Russian literature between German Goncharov and Gennadii Gorelik as to whether the Soviet inventor of the H-Bomb Andrei Sakharov benefited from information obtained, *inter alia*, from Klaus Fuchs via intelligence channels. This debate is beyond the scope of this chapter but it does serve as a reminder of the importance of espionage in the early Cold War arms race.

[13] German Goncharov, 'Istoriya otechestvennoi dvukhstupenchatoi vodorodnoi bomby i nauchnaya etika', *Priroda* 4 (2009), 42.

not much.' Nuclear destruction of the Soviet Union, in his words, required at least 10,000 bombs. Zhukov predicted that it would be a 'normal feature' of future conflicts that armies would use nuclear arms, and these would indeed be used as 'a main striking power'.[14]

Although Zhukov was purged in October 1957, his views remained widely influential in the military establishment. Among the tasks the Soviet military set to itself in 1958 was learning how to 'quickly move one's forces out from under atomic strikes of the enemy' and, in turn, 'effectively use atomic weapons' to destroy the opponent's armies.[15] The emphasis was increasingly laid on the 'maximum use of all means of destruction and, first and foremost, atomic weapons'. The general idea was that an atomic war could be won, as long as the Soviets could find ways to respond to a US first strike with 'immediate or *simultaneous* devastating retaliatory blows from land, air, and sea'. The generals carefully side-stepped the uncomfortable details, proposing instead to 'explore' the means and ways for waging such blitzkriegs.[16]

MISSILES LIKE SAUSAGES

On 19 October 1953, several months after Stalin's death, the Soviet Minister of Medium Machine-Building (that is, the Soviet atomic programme) Vyacheslav Malyshev, and his deputy Mikhail Khrunichev, sent to the Soviet leadership a remarkably prescient analysis of the state of development of military technology. They argued that the losses suffered by a nuclear bomber force would be too great in an event of a potential conflict, and, at 50–60 million rubles per bomber, ultimately uneconomical. A much better idea was to develop a missile with a nuclear warhead, something, Malyshev and Khrunichev noted, the Americans were very actively working on. Such a missile would be 'a very terrible and powerful weapon', a lot less vulnerable than airplanes, yet, at about 1 million rubles a piece (projected cost for the SS-3 missile[17]), it would cost only a tiny fraction of the expense of a bomber. Although at that point in time bombers were still thought to be a lot more accurate than missiles in delivering payloads, this handicap was to be compensated for by arming would-be missiles with ever more powerful thermonuclear warheads: these would do just fine, as long as they fell anywhere in the general target area.[18] For the new Soviet leader Nikita Khrushchev, nuclear missiles were a magic

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[14] Notes of informal conversation between P. Ratnam and Georgi Zhukov, 21 March 1957, Nehru Memorial Museum and Library: Subimal Dutt Papers, folder No. 50, p. 313.

[15] Byrne, Malcolm, and Vojtech Mastny, eds., *A Cardboard Castle?: an Inside History of the Warsaw Pact, 1955–1991* (Budapest, 2005), 93–4. Note the revised translation from the original document by this author.

[16] From the directive of the Minister of Defence of the USSR No. 0059 regarding operational preparedness for 1959, 25 October 1958, *Zadacha Osoboi Gosudarstvennoi Vazhnosti* (Moscow, 2010), 720–6.

[17] All missile numbers are given in NATO (SS) rather than Russian (R) classification.

[18] Report from V. A. Malyshev and M. V. Khrunichev to G. M. Malenkov about the necessity of reviewing the question of management of the production of missiles and adjustment of missiles for the delivery of atomic and hydrogen warheads, 19 October 1953, *Zadacha Osoboi Gosudarstvennoi*

solution to all problems of defence: 'How does an intercontinental missile work?'—he explained enthusiastically—'we have been told: you press the button and it's done.'[19]

Khrushchev's fascination with the effectiveness and relatively low costs of nuclear missiles prompted his now famous deep cuts in the Soviet conventional forces. In January 1960 the Soviet Union announced unilateral downsizing of the army by some 1.2 million servicemen: 'To keep such a large army,' Khrushchev argued in an internal memo, 'means to lower our economic potential.'[20] 'Why do we need [this] shield—huge armies concentrated in Europe? This is old junk, scrap metal, which hangs like pounds of weights on the neck of the people, distracting millions of working hands from creative labour.'[21] At a time when Soviet security was guaranteed—at the push of a button—by a growing arsenal of ICBMs, such expenses were simply unwarranted. Pre-empting criticism that he was cutting down on Soviet defences without reciprocity from the West, Khrushchev argued that, by contrast, the large armies of the Soviet Union's opponents would serve as Moscow's 'allies' because 'they would devour budgets, lower economic development of these countries, and facilitate the growth of advantages of our system'.

Although Moscow did not have the kinds of internal debates about nuclear deterrence that were seen in Washington in the late 1950s and early 1960s, there is no question that Khrushchev saw the Soviet missile arsenal as a deterrent against imperialist aggression, the ultimate guarantee of Soviet security. On 8 December 1959, in a memorandum directed to his comrades in the leadership, Khrushchev argued that the nuclear shield in effect made the USSR immune to attacks from without: 'How can any country or group of countries in Europe invade us when we can literally wipe these countries off the face of the earth with our atomic and hydrogen weapons and by delivery of our missiles to any point on the globe?'[22] The answer, so he thought, was that no one would do that, and the logical conclusion from this line of argument was to continue building up the nuclear stockpile.

Khrushchev also discovered that even the threat of nuclear war was in itself an important trump card in the making of foreign policy. He pioneered this tactic during the 1956 Suez crisis, and resorted to it on occasion in the subsequent years. 'We keep the enemy in fear by our missiles,' the Soviet leader confided to China's Mao Zedong in July 1958. 'We wrote to the Turks that with 3 to 4 missiles there would be more Turkey. 10 missiles suffice to wipe out England. In England they debate: some say that 9 missiles are needed to destroy England, others say, no, 7 to 8.

Vazhnosti, 332–6 and from a report from V. A. Malyshev and others to the Presidium of the CC CPSU on the creation of a long-range missile with a nuclear warhead, 25 November 1953, *Ibid.*, 339–40.

[19] Nikita Khrushchev's speech, 1 November 1957 in V. Naumov ed., *Georgii Zhukov: Stenogramma Oktyabr'skogo (1957 g.) Plenuma TsK KPSS i Drugie Dokumenty* (Moscow, 2001), 477.

[20] Memorandum by Nikita Khrushchev, 8 December 1959 in A. A. Fursenko, ed., *Prezidium TsK KPSS, 1954–1964* (Moscow, 2003), 63.

[21] Cited in Yu. A. Abramova, 'Nezavershennaya reforma N.S. Khrushcheva: Preobrazovanie Voobruzhennykh Sil SSSR v 1953–64 gg., *Vestnik Moskovskogo Gosudarstvennogo Oblastnogo Universiteta*, 4 (2001), http://www.evestnik-mgou.ru/Artices/Doc/148.

[22] *Zadacha Osoboi Gosudarstvennoi Vazhnosti*, 876.

But nobody doubts that, in case of nuclear war England will be destroyed. They only debate how many missiles one needs for this. When we wrote letters to Eden and [French prime minister] Guy Mollet during the Suez events, they immediately stopped the aggression. Now, that we have the transcontinental missile, we hold America by the throat as well. They thought America was beyond reach. But this is not true. Therefore, we must use these means to avoid war.'[23]

This, then, is how the Soviet Union came to be so heavily invested in the nuclear missile programme: missiles were militarily effective and economical. They could assure Soviet security in ways than no conventional weapons ever could. Finally, they were a loud argument in the making of foreign policy, a means of intimidating one's opponent. By 1956 the first SS-3s were being deployed with the Soviet armed forces, and the following year saw a successful test of the SS-6, the first intercontinental ballistic missile. A variant of this missile put the Sputnik, the first man-made satellite, into a near-earth orbit on 4 October 1957. A few days later Khrushchev famously announced that the Soviet Union was 'turning out missiles like sausages': his unhelpful bravado, amplified in the beeps of the Sputnik flying overhead, prompted premature calls in the United States to close the 'missile gap'.[24] In the meantime, the actual Soviet deployment of ICBMs went from only two in 1960 to 226 in 1965 and to 1,434 in 1970.[25]

ARMS CONTROL

Until he breathed his last Stalin believed that a third world war would break out sooner or later, but his successors were not nearly as unequivocal. One of the first to sound the alarm was the Soviet Premier Georgii Malenkov, who famously announced in a public address on 12 March 1954 that a war between the Soviet Union and the United States 'would mean the end of world civilization'.[26] Malenkov's rivals in the leadership, including Nikita Khrushchev, criticized him for his failure to direct public opinion into the 'struggle against the criminal plots of the imperialists to unleash an atomic war', but no sooner had Khrushchev himself consolidated power than he embraced a similar position, renounced the thesis about the inevitability of war, and proclaimed his adherence to the principle of peaceful coexistence between socialism and capitalism.[27] 'We lived through one

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[23] Memorandum of conversation between Nikita Khrushchev and Mao Zedong, 31 July 1958, Arkhiv Prezidenta Rossiiskoi Federatsii [hereafter APRF], f. 52, op. 1, d. 498, ll. 44–77, copy in Reel 17, Dmitrii Volkogonov Collection, Library of Congress, Washington, D.C. [hereafter LC]; translation from Russian by David Wolff. Published in CWIHP Working Paper No. 30. *Cold War International History Project Digital Archive.*

[24] Richard Ned Lebow, 'Was Khrushchev bluffing in Cuba', *Bulletin of Atomic Scientists* 44 (1988), 38–43.

[25] Pavel Podvig et al eds., *Russian Strategic Nuclear Forces* (Cambridge, MA, 2001), 136–7.

[26] Yuri Smirnov and Vladislav Zubok, 'Nuclear Weapons After Stalin's Death: Moscow Enters the H-Bomb Age', *Cold War International History Project Bulletin*, No. 4 (1994), 15.

[27] On Malenkov's 'mistakes' see Draft resolution of the CC CPSU Plenum, January 31, 1955, A. A. Fursenko, ed., *Prezidium TsK KPSS, 1954–1964: Postanovleniya, 1954–1958* (Moscow, 2006), 41.

war,' Khrushchev said, 'but we know what sort of war we would have now—we ourselves have these means. These are terrible means!'[28] Even as the Soviet military strategists were making plans for nuclear conflict, Khrushchev himself was beginning to discount the very idea of war.

Indeed, after the invention of the ICBM, Khrushchev was growing more optimistic that Soviet strength would preclude war: the imperialists would not dare to unleash a conflict when they understood its fatal consequences. This was Khrushchev's version of Mutually Assured Destruction: surely Washington would not be so unreasonable as to plunge the world into a suicidal war. But by the early 1960s the Soviet leader was not so sure. John F. Kennedy's election was an important turning point. Khrushchev thought him a weak, inexperienced leader. Eisenhower, though 'the same shit' as Kennedy, had been a general himself, someone who could keep the military and ravenous (and war-minded) capitalists under control, but whether JFK could do that was an open question: 'In the capitalist countries,' Khrushchev argued, 'those who determine policy are not always at the front line. They are often in the shadows…'[29] Kennedy had plenty of people like this in his administration, people who really ran the White House, in Khrushchev's interpretation.

In addition to this, there was a danger that a madman could come to power, someone who would ignore the logic of nuclear warfare. Khrushchev did not have to look far for examples. His experience with China—especially during the 1958 Taiwan Straits crisis, when Mao Zedong unexpectedly launched shelling of the Guomindang-held islands off the Chinese coast—made a strong impression on him, probably playing into his decision in 1959 to scrap an earlier agreement to supply China with a prototype of an A-bomb. Chairman Mao made scary statements in the aftermath of Sputnik to the effect that one should not be afraid of a nuclear war. Khrushchev was sceptical that Mao wanted war; he thought the Chinese were afraid of war 'like the devil of holy water': but, then, he could never be completely sure.[30] And his uncertainty added to the attraction of disarmament. This way, as Khrushchev put it at the Central Committee Presidium in February 1960, 'even if a madman came to power but he had no knife, he cannot be dangerous, and when he begins to sharpen his knife, everyone will see that he is a madman, and it will be possible to tie him down'.[31]

The final consideration that prompted Khrushchev's increasing interest in arms control was his increasing awareness of the dangers of inadvertent war. He was alarmed by some of the results of the Soviet missile tests. It was not uncommon for missiles to explode in mid-air or fall far short of their range, causing damage on the ground. Two of the sixteen SS-6 ICBMs launched between August 1958 and

[28] N. G. Tomilina et al eds., *Nikita Sergeevich Khrushchev: Dva Tseta Vremeni*, Vol. 2 (Moscow, 2009), p. 369.

[29] I. Kazarina et al. eds., *Venskii Val's Kholodnoi Voiny. Vokrug Vstrechi N.S. Khrushcheva i Dzh. F. Kennedi v 1961 godu v Vene* (Moscow, 2011), 150.

[30] Conversation between John Gollan and Nikita Khrushchev, 2 January 1963, Labour History Centre, Manchester, United Kingdom, CP/CENT/INT/02/04.

[31] A. A. Fursenko ed., *Prezidium TsK KPSS, 1954–1964*, 425.

November 1959 actually overshot the supposed target by more than 2,000km.[32] In July 1959 Khrushchev shared his worries with visiting US Vice President Richard Nixon, saying that the Soviets had feared one of these missiles would land in Alaska, though it fortunately fell into the ocean.[33] 'War,' Khrushchev pondered in April 1961, 'can happen as a result of purely psychological circumstances. In the situation of tensions, when military emergencies are declared, one of the people who have access to nuclear weapons might lose his nerve, and he can pull all of us into the war. It won't be clear in the country where [the missile] falls whether it was accidental or intentional. I would like to stress again that the danger of inadvertent war will grow.'[34]

Despite these reflections Khrushchev continued to engage in nuclear brinkmanship, with his decision, in the spring of 1962, to ship Soviet missiles to Cuba. The Soviet–US confrontation over Cuba in October suddenly made frightfully possible all those scenarios of inadvertent war Khrushchev had earlier theoretically contemplated. Here was an inexperienced JFK puppeteered by shadowy militarists and capitalists. Here was his own ostensible ally, the proverbial 'madman' Fidel Castro who, in the middle of the crisis, called on Khrushchev to make a first nuclear strike against the US. And there were too many people in the military with their impatient fingers too close to the button.

The scare of October 1962 left a deep impression on Khrushchev. In the months that followed he returned to the question of arms control in Soviet–US talks, and now, for the first time, Khrushchev's letters to Kennedy showed interest in achieving a breakthrough—not for the propaganda value, not even to cut costs, but to reduce the danger of war. 'What happened,' he wrote in November, 'should now prompt us to make new great efforts so that no repetition of such events should be allowed because if we succeeded in finding a way out of a dangerous situation this time, next time we might not safely untie the tightly made knot. And the knot that we are now untying has been tied rather tightly, almost to the limit.'[35] These efforts led, by August 1963, to the signing of a Partial Test Ban Treaty, the first real achievement of the struggle to contain the arms race. Yet détente did not last: Kennedy's death in November 1963 and Khrushchev's ouster from power in October of the following year eroded the personal element making for restraint in the Soviet–American relationship. From the mid-1960s, faced, on the one hand, with the widening war in Vietnam and a build-up of tensions in the Middle East, and, on the other hand, with the worsening security situation on the Sino-Soviet frontier, the Soviet Union was producing, storing, and selling more weapons than ever. The arms race entered a new phase.

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[32] *Zadacha Osoboi Gosudarstvennoi Vazhnosti*, 914.

[33] Conversation between Richard Nixon and Nikita Khrushchev, 26 July 1959 in *Foreign Relations of the United States (FRUS), 1958–1960: Eastern Europe Region, Soviet Union, Cyprus* (Washington D.C., 1993), 359.

[34] A. A. Fursenko ed., *Prezidium TsK KPSS, 1954–1964: Postanovleniya, 1959–1964* (Moscow, 2008), 852.

[35] Letter from Nikita Khrushchev to John F. Kennedy, undated, in *Foreign Relations of the United States* [hereafter *FRUS], 1961–1963: Kennedy-Khrushchev Exchanges* (Washington D.C., 1996), 283.

FROM THE ARMS RACE TO 'NEW THINKING'

By the late 1960s the Soviet Union was finally approaching the long-sought parity with the United States in nuclear armaments. Although in some respects (for instance, in the area of multiple—'MIRVed'—warheads, and submarine development) the Soviets lagged considerably behind the United States, their build-up of land-based ICBMs (SS-9s and SS-11s) guaranteed the USSR a second-strike capability, that is, the ability to destroy the United States in case of a nuclear war: 'I cannot […] guarantee that we are ahead of America and England in all types of weaponry, but on the whole we are stronger than they are,' Brezhnev proclaimed in June 1967 at a closed party meeting, and his confidence translated into renewed Soviet willingness to engage in arms control.[36] In 1969 Soviet and American negotiators began discussions on limiting strategic arsenals, a process that would lead, by 1972, to key agreements: the Anti-Ballistic Missile (ABM) Treaty and the Strategic Arms Limitation Treaty (SALT-1), and the ushering in of détente in Soviet–American relations.

There is an extensive literature on the SALT process, most of it exploring motivations and decision-making process on the American side. For the White House, reaching agreement with the Soviets was often less a matter of limiting the arms race than of gaining political leverage over Moscow through the policy of 'linkage' between arms control agreements and other areas, such as obtaining Soviet help in finding a resolution to the problem of the US entrapment in Vietnam. Moscow pointedly refused to recognize any such linkage, and pursued SALT for a different set of reasons: to save money, and to improve Soviet–American relations, which promised the laurels of a peace-maker to Brezhnev and commercial benefits to his country and would tie the Americans down, limiting their aggressive intent. Finally, the agreement was a practical manifestation of the newly attained status of 'equality' with the United States.

The hierarchy of Soviet reasons is a matter of debate. In internal discussions with the party faithful, and with his allies in the socialist camp, Brezhnev frequently invoked the economic argument. Strained relations with the United States, and a tense international situation, he argued at a party plenum in May 1972, forced the Soviet Union to devote more funding to national defence and support of clients overseas (e.g. Vietnam and North Korea), at the expense of domestic construction. This was a serious concern at a time when the Soviet economy was beginning to show signs of stagnation. Brezhnev believed that the achievements of arms control negotiations, i.e. the Anti-Ballistic Missile Treaty and the interim agreement to freeze parts of strategic arsenals, would allow the Soviet Union to avoid an increase in budgetary expenditures.[37] In the event, this expectation proved misplaced, principally because Brezhnev's commitment to arms control was not strong enough to override the insatiable appetite of the Soviet military-industrial complex, and in fact

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[36] Leonid Brezhnev's speech at June 1967 Plenum of CC CPSU, 21 June 1967, Rossiiskii Gosudarstvennyi Arkhiv Noveishei Istorii [hereafter RGANI]: fond 2, opis 3, delo 64, list 110.

[37] Leonid Brezhnev's speech at May 1972 Plenum of CC CPSU, 19 May 1972. RGANI: fond 2, opis 3, delo 270, list 52.

the Soviet leader—even as he put his name to SALT—privately assured his party comrades that these agreements would 'in no way obstruct the implementation of the existing programmes to further strengthen [Soviet] defence'.[38]

Though of course unhappy about the high costs of the arms race, Brezhnev did not seek arms control just to cut costs. A bigger reason—as has already become evident from the work of historian Vladislav Zubok—was that Brezhnev genuinely sought improvement in Soviet–American relations, seeing arms control as a means to this end.[39] Following Khrushchev, who had in his time feared the influence of the military and defence procurement lobbies on the White House, Brezhnev believed that the arms control agreements would 'ruin the plans of the most aggressive US circles'. In this respect, the ABM agreement (which limited the arms race in defences against ballistic missiles) proved especially useful to the Soviet Union because (in Brezhnev's interpretation) it had the effect of 'strengthening the deterrent influence of our might on the policy of the US rulers'.[40] All of this allowed Moscow to speak to the United States on the basis of equality, and resolve international issues on favourable terms, with the Indo-Pakistani war of 1971 and the Arab–Israeli war of 1973 being two prime examples of Moscow being able to stand up for its clients. In other words, arms control agreements were seen by the Soviet leaders as a means of assuring the Soviet Union's status as a superpower.

Equality of status, in the Soviet interpretation, meant equality of opportunity in extending the Cold War to the Third World. The 1970s and early 1980s saw increasing Soviet involvement in the covert and overt support of revolutionary wars and client regimes in Angola, Mozambique, and Ethiopia, throughout the Middle East, in parts of Latin America, and in South East Asia. This involvement—as well as US counterinvolvement—had the effect of exporting the superpower arms race to volatile locales, and it continued (despite improving Soviet–US relations) right through until the end of the Cold War. Among the largest recipients of Soviet weaponry in the 1980s were Iraq (13.2 billion rubles), Syria (10.2 billion rubles), Libya (6.7 billion rubles), and traditional Soviet allies such as Cuba (7.4 billion), Vietnam (4 billion), and North Korea (1.9 billion rubles).[41] The 1979 Soviet invasion of Afghanistan soon turned into a quagmire, adding billions of rubles in military expenditure to the Soviet Union's overblown defence budget. Global projection of power and global commitments called for new investments in the industries of war at the height of détente. What Nikita Khrushchev had feared in the late 1950s—the burden of conventional armaments stifling economic production—and what he had hoped to avoid by putting emphasis on the nuclear build-up, came to pass all the same. It did so even though, unlike in the late 1950s,

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[38] *Ibid.*

[39] Vladislav Zubok, *A Failed Empire: the Soviet Union in the Cold War from Stalin to Gorbachev* (Chapel Hill NC, 2009), 192–207.

[40] Leonid Brezhnev's speech at May 1972 Plenum of CC CPSU, 19 May 1972. RGANI: fond 2, opis 3, delo 270, list 51.

[41] Memorandum from K. Katushev to A.S. Chernyaev, 15 July 1991, Gorbachev Foundation Archive, Moscow, Russia: fond 2, document 8997.

the Soviet Union of the late Brezhnev era had the means of countering any nuclear or conventional threats.

To understand why this happened, it is helpful to think in terms of inertia. Colossal Soviet spending on both nuclear and conventional arms created a sprawling military-industrial complex tied together through a centrally coordinated research, development, and production plan. Although there was a degree of built-in competition in the system, e.g. in the operation of design bureaux, the tendency was to fund production across the board. This became easier with the rising status of the Ministry of Defence during the Brezhnev years: from 1973 the Defence Minister (first Andrei Grechko and, from 1976, Dmitrii Ustinov) served concurrently as a member of the Politburo, and carried significant weight in all senior decision-making, ensuring that the interests of the defence industry were not infringed upon. These interests were first and foremost bureaucratic and institutional interests rather than interests of defence per se. As the Russian economic historian Yegor Gaidar had put it, 'the production of weapons was not determined by military needs but by production capabilities'. Gorbachev's chief of the general staff Sergei Akhromeev explained the logic: 'Why do we need to make so many weapons? [...] Because through enormous sacrifice we have created first-class plants that are no worse than what the Americans have. What, are you going to tell me to stop working and make pots and pans instead?'[42] This bureaucratic input into the Soviet policy-making was largely unaffected by the broader climate of East–West relations, which is one of the reasons why détente did not result in decreasing Soviet military spending, and did little to alter the pitch of the arms race, nuclear or conventional.

In the meantime, the much-sought after strategic parity—which the SALT process was meant to celebrate—proved extremely unstable. This was in part because the Soviet and the American nuclear arsenals were so different: the Soviet nuclear force was heavily reliant on land-based missiles, with the submarine-launched ballistic missiles and bombers decidedly weaker. The US 'triad' was more balanced. The arms control negotiators had to find ways to bring apples and oranges to a common denominator, something that often proved too difficult to achieve. Thus, intermediate range missiles were left on the sidelines of the SALT discussions, as were tactical nuclear weapons and conventional weaponry. Yet real or even imaginary breakthroughs in any of these spheres could unsettle the general military balance. This was in fact what began to happen in the mid-1970s, at the height of the superpower détente.

In particular, the Soviet military, long confident of their massive conventional superiority in Europe, began to worry about NATO's growing technological edge. The chief of Soviet military intelligence Petr Ivashutin argued in December 1978 that the West's deployment of new weapons systems could undermine Moscow's chances in a European war. War games by the Warsaw Pact, which had previously assumed a sweeping counter-offensive by the Soviet forces, taking them to the English Channel in a matter of days, now predicted much less optimistic

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[42] Yegor Gaidar, *Collapse of an Empire: Lessons for Modern Russia* (New York, 2008), 112.

scenarios.[43] It was in the light of these perceived vulnerabilities that the Soviet leadership decided, from 1976, to upgrade their intermediate nuclear forces by replacing the unwieldy and obsolete SS-4 and SS-5 missiles with the much more effective SS-20s. From the Soviet perspective, this upgrade was simply a matter of maintaining parity or, as the Polish leader Wojciech Jaruzelski described it, 'a desperate attempt to somehow compensate for the West's ever more obvious superiority in advanced technology'.[44] This was not, as the West had feared, an effort to gain one-sided political-military advantage.[45] The Soviet logic was articulated by Leonid Brezhnev himself at a Warsaw Pact conference in May 1980: 'Our principled position,' he said, 'is not to allow the military balance in Europe to be upset. We do not upset it ourselves when we upgrade our intermediate range nuclear potential—after all, the Americans have done it long ago.'[46]

Brezhnev, like so many policy makers before and after, perceived his actions as a rational and reasonable response to the challenge posed by Moscow's foreign adversaries, without recognizing that they could in their turn be interpreted as a challenge to the status quo. The same, though, could be said of the Western leaders who—without understanding Moscow's military concerns—assumed that the Soviets were trying to tilt the military balance. The SS-20s, which threatened US allies in Europe but could not reach the United States itself, were thought in Washington to be a part of a carefully thought-out plan to challenge the US commitment to European defence. In response, NATO agreed in December 1979 to the US deployment of a new generation of ground-launched cruise missiles and medium-range Pershing II ballistic missiles that would counter perceived Soviet superiority. The Soviets were appalled by this turn of events, decrying NATO's attempt to achieve military preponderance in Europe at the expense of the Warsaw Pact.[47] The Soviets and their allies concluded that Washington was trying to 'turn Western Europe into an anti-Soviet missile carrier'.[48]

The controversy over these so called 'Euromissiles' gave rise to a new round of the arms race. It also helped undermine the achievements of the SALT process, which collapsed in 1979 when the US Senate failed to ratify the hard-bargained SALT-II agreement to cap the strategic arsenals of the two superpowers. The general condition of East–West relations plummeted to new depths after the Soviet

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[43] Malcolm Byrne and Vojtech Mastny, eds., *A Cardboard Castle?*, 47.

[44] *Ibid.*

[45] Raymond Garthoff, *Détente and Confrontation: American-Soviet relations from Nixon to Reagan* (Washington D.C., 1994), 965. This was true in fact not only of SS-20s but of the entire Soviet strategic modernization programme. See Pavel Podvig, 'The Window of Vulnerability That Wasn't': Soviet Military Build-up in the 1970s', *International Security* 33/1 (2008), 118–38.

[46] Stenographic Record of the Political Consultative Committee Meeting in Warsaw, 14 May 1980. Available at: http://www.php.isn.ethz.ch/collections/colltopic.cfm?lng=en&id=18312&navinfo=14465.

[47] Speech by Andrei Gromyko at a Warsaw Pact meeting, 5 December 1979. Available at: http://www.php.isn.ethz.ch/collections/colltopic.cfm?lng=en&id=20062&navinfo=15699. Courtesy of the Parallel History Project.

[48] Memorandum of Conversation between Fidel Castro and Erich Honecker, 25 May 1980, trans. by Svetlana Savranskaya, *Cold War International History Project Digital Archive*, available at: http://digitalarchive.wilsoncenter.org.

invasion of Afghanistan in December 1979 and the declaration of martial law in Poland in 1981. In 1980 President Jimmy Carter signed Presidential Directive (PD) 59 (parts of which were soon leaked to the press), which lowered the threshold for a 'flexible' nuclear strike aimed at decapitation of the Soviet command and control centres. The arrival of Ronald Reagan on the scene—accompanied by hair-raising anti-communist rhetoric—further raised Soviet apprehensions about US intentions. After the deployment of Pershings began in late 1983, the Soviets walked out of arms control negotiations with the US. In November 1983, the NATO command control exercise 'Able Archer,' which simulated nuclear attack, brought the two superpowers to the brink of nuclear war by miscalculation.[49]

The arms race thus played a central role in the dismantling of détente and the beginning of the 'Second Cold War' in the late 1970s—early 1980s. But was it a consequence of the superpower confrontation, or its cause? The fall of détente cannot be attributed to any one reason. There were conflicts in the Third World, as in Angola and Mozambique. There was competition in the Middle East. There was the Soviet invasion of Afghanistan. There was martial law in Poland. What was special about the 'Euromissile' controversy is that more than anything else it undermined trust. What were the Soviets' intentions in upgrading their intermediate missile arsenal? No one in Washington could tell with certainty, and so American leaders assumed the worst. The same was true for the Soviet reaction to the US deployment of Pershings. The prospect of being about five minutes away from nuclear obliteration—courtesy of Pershings—was deeply unsettling for the ageing, neurotic Soviet leadership, a reminder that for all the West's statements to the contrary, it harboured ill intent and only waited for the right opportunity to realize its aggressive ambitions. The only way to keep the aggressors at bay was to 'keep the powder dry'. The Euromissiles can thus be seen as a contributing cause, as much as a consequence, of the fall of détente, which only serves to underscore the intricate relationship between the Cold War and the arms race.

ENDING THE ARMS RACE

Given the level of hostility in superpower relations in the early 1980s, few people could have predicted or anticipated the end of the Cold War by the end of the

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[49] There is disagreement about how close Able Archer came to a nuclear war. For conventional take see David Hoffman, *The Dead Hand: Reagan, Gorbachev, and the Untold Story of the Cold War Arms Race* (New York, 2009); Christopher M. Andrew and Oleg Gordievsky, *Comrade Kryuchkov's instructions: KGB foreign operations, 1975–1985* (Stanford CA, 1993), 67–90; Benjamin B. Fischer, *A Cold War Conundrum: The 1983 Soviet War Scare* (History Staff Center for the Study of Intelligence, 1997), https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/books-and-monographs/a-cold-war-conundrum/source.htm#HEADING1–07; Nathan Jones, 'Operation RYAN, Able Archer 83, and Miscalculation: The War Scare of 1983', paper presented at the International Graduate Student Conference on the Cold War, UCSB, Santa Barbara, April 2008; Beatrice Heuser, 'The Soviet Response to the Euromissile Crisis', in Leopoldo Nuti, ed., *The Crisis of Détente in Europe: from Helsinki to Gorbachev, 1975–1985* (London, 2009), 137–49. A more sceptical view is Dima Adamsky, 'The 1983 Nuclear Crisis – Lessons for Deterrence Theory and Practice', *Journal of Strategic Studies* 36/1 (2013), 4–41.

decade. The arms race—a constant feature of international politics for over forty years, an axiom that seemed inseparable from the theory and practice of state-craft—suddenly and almost inexplicably fizzled out. It is clear in retrospect that the key role in this about-face belonged to Mikhail Gorbachev, who took the reins of power in the USSR in March 1985. It was Gorbachev who, in the summer of 1985, declared a unilateral moratorium on nuclear testing. It was he who, in January 1986, put forward an idealistic and unrealizable programme of ridding the world of nuclear weapons by the year 2000. It was Gorbachev who, in October 1986 in Reykjavik, presented US President Ronald Reagan with an astonishing proposal to halve the nuclear triad—and nearly clinched a deal. And it was Gorbachev who made the brave decision to destroy SS-20s not only in Europe but in Asia as well, signing, in December 1987, the first Soviet–American arms control treaty that eliminated a whole class of weapons—intermediate-range nuclear missiles. It is fair to add that Reagan also played a role in achieving these breakthroughs, but Gorbachev, unquestionably, held the initiative.

What were his reasons? First, to an even greater extent than Khrushchev and Brezhnev, Gorbachev was worried about the spiralling costs of the arms race. The cost-cutting motive was clearly present particularly in his early arms-control initiatives, giving some credibility to the otherwise questionable hypothesis that Reagan 'won' the Cold War by bankrupting the Soviet Union through ambitious programmes like the Strategic Defense Initiative, otherwise known as 'Star Wars'. Time after time, in meetings of the Soviet Politburo, Gorbachev complained about US attempts to 'exhaust' the USSR by drawing it into another arms race. ' "Tridents," "Minutemen," entry of weapons into space…' he argued in October 1986, referring to US nuclear missiles, 'Then, [we'll have] decreased ecological, strategic and political security. We'll lose everywhere, and first and foremost there is the exhaustion of our economy. And this is unacceptable. Therefore, let's not cling to particularities, not seeing the main thing behind the details […] If they impose another round of the [arms] race on us, we'll lose!'[50] This was said just days before Reykjavik, which witnessed the most breathtaking disarmament proposal of Gorbachev's tenure.

Yet it would be unduly simplistic to claim that Gorbachev called it quits only because his country could no longer afford the arms race. In fact, the Soviets were in many ways in a better position financially, as well as in terms of military technology, than they were after the Second World War, when Stalin made an all-out effort to get the Bomb, or in the late 1950s, when Khrushchev committed his country to producing missiles 'like sausages'. Expensive, yes—but Gorbachev also realized that the arms race was extremely dangerous. Gorbachev, already a high-ranking Politburo member at the time of the war scare in 1983, was fully cognizant of the danger Pershings posed to the USSR—'it's like having a gun to our head'. As he put it to his advisers, 'a hundred missiles—and the whole of Europe is fucked'.[51]

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[50] Record of a meeting of CC CPSU Politburo, 8 October 1986 in Anatolii Chernyaev ed., *V Politbyuro TsK KPSS…* (Moscow, 2006), 87.
[51] Mikhail Gorbachev's comments to his advisers, 4 October 1986, Anatolii Chernyaev, ed., *V Politbyuro TsK KPSS…*, 84.

This pertinent observation came only a few months after April 1986, which witnessed the world's worst civilian nuclear accident at Chernobyl power plant in the Ukraine. Gorbachev was profoundly shocked by the Chernobyl experience. Now, he said, he felt the 'breath' of nuclear war. He knew what nuclear war would be like. Like the earlier Soviet leaders, who had learned their lessons from the Cuban Missile Crisis, Gorbachev, too, learned his lesson from the nuclear horrors of 1983–6: a nuclear war could never be fought, and so the arms race simply did not make any sense. But whereas both Khrushchev and Brezhnev, for all their commitment to arms control, were unable to deliver on their agendas in the face of the pressures of the Cold War, Gorbachev accomplished exactly that.

This brings us to another important reason for the end of the arms race—Gorbachev's worldview, his fabled 'new thinking'. This point should not be over-emphasized, for there is a tendency in the existing literature to glorify Gorbachev as a visionary who could rise above the narrow confines of Cold War logic and embrace universal values. His policies sprang from a wide range of motives and often reflected consensus and compromise among Soviet decision-makers. But 'new thinking' was not just a phantom or a propaganda ploy, even though there was a good deal of posturing in Gorbachev's proposals. For all his avowed adherence to Marxism-Leninism in his first years in power, Gorbachev's way of thinking was often less rigid and less fixated on official dogma. Unlike his predecessors, who sometimes approached arms control as just another form of struggle against 'American imperialism', Gorbachev pursued it for its own sake. True, his commitment was not absolute, and he, too, was not above pulling nasty tricks and concealing the truth, as, for instance, David Hoffman shows in his investigation of the Soviet biological weapons programme, in which Gorbachev was secretly complicit very late into the game.[52] But it is hard to imagine Khrushchev or Brezhnev, much less Stalin, saying, as Gorbachev did in a circle of his close confidants: 'We really do want détente and disarmament. An unfair game is impossible now. In any case, no one will be able to fool anyone else.'[53]

CONCLUSION

On 30 October 1961 the Soviet Union set off the most powerful man-made explosion the world had ever seen. The 'tsar bomb' dropped on the testing range in Novaya Zemlya, an island in the Arctic, had a design capacity of 100 megatons; it was purposefully brought down to fifty to allow the bomber crew enough time to escape. The flash of light from the blast was visible at a distance of 1,000km, and the sonic boom went around the world three times. The testing site was swept clean—'like a skating rink'—reported one witness. The nuclear fall-out from this and the previous nuclear test (also by the USSR) equalled all fall-out from all nuclear tests carried out until that date. It was 'a weapon of pure terror' concluded

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[52] Hoffman, *The Dead Hand*.
[53] Anatolii Chernyaev, ed., *V Politbyuro TsK KPSS…*, 32.

The New York Times, which 'could only have one purpose—to shock and to intimidate'.[54] This demonstration showed the awesome power of modern nuclear weapons, and the absurdity of their continued accumulation. But the accumulation continued, until, in a few years' time, the Soviet Union and the United States possessed enough weapons to destroy each other several times over.

Was the arms race a predictable outcome of superpower competition? Because the Cold War *was* a competition—ideological, economic, scientific—it was only natural that the two powers would also compete in the military sphere. And in fact, often it was precisely this competitive spirit and the underlying insecurities of being defenceless before the enemy that drove the arms race up new spirals of antagonism, as witnessed, for instance, with the US, and then Soviet, decisions to pursue the hydrogen bomb. But competition is just a superficial term. It does not explain the reasoning behind key decisions. This paper has shown that from the Soviet perspective 'competition' often meant as much the pursuit of prestige as the pursuit of security. Stalin's initial approach to the Bomb as a symbol of great-power status underscores this point. The same is true of later Soviet efforts, under Brezhnev and Kosygin, to catch up with the size of the US nuclear stockpile. This was not because having thousands of warheads added up to greater security, but because they added up to a measure of equality with the United States at a time when the Soviet Union was falling behind in key economic indicators.

But the arms race was more than a consequence of the Cold War. It was also an important contributing factor. Its effect was uncertainty and insecurity—uncertainty about the adversary's abilities and intentions, and insecurity as the price of assuming the worst. The arms race and mistrust went hand in hand, and it was this mistrust between the Soviet Union and the United States that played the defining role in crashing the wartime alliance, setting the two superpowers on a collision course and repeatedly undermining efforts to achieve détente. To use Gorbachev's colourful imagery, when each side was holding a gun to the other's head, a win-win solution was very difficult to obtain. Thus, even if it is perhaps incorrect to say that the arms race *caused* the Cold War, it clearly did much to determine its character and intensity. It was the arms race that made the Cold War the most dangerous conflict the world had ever experienced. And the most expensive.

The issue of costs was in many ways central to the arms race. Common sense would suggest that armaments competition is inherently pricey. Yet, ironically, production of new types of weapons was sometimes a path to considerable savings. This was especially the case for Nikita Khrushchev, whose legendary enthusiasm for missiles as a more effective but (most importantly) cheaper alternative to all other arms led him to send hundreds of thousands of Soviet servicemen—'cannon fodder' in a nuclear age—into retirement, and to put brakes on the development of new conventional armaments. Even his passion for grand atmospheric nuclear tests, like the 50-megaton monster mentioned above, was (in addition to intimidation noted by the *New York Times*) a cost-saving measure needed for the creation of better and cheaper bombs. In the long term, of course, these savings were wiped

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[54] 'Fifty Megatons of Terror', *The New York Times*, 31 October 1961, 30.

out by the costs of staying abreast one's opponents and by the insatiable appetites of the Soviet military-industrial complex that, just as Khrushchev predicted, distracted millions of Soviet hands from creative labour. By the time Gorbachev came to power in the USSR, the arms race had become an unsustainable burden for the Soviet economy.

This was a heavy burden throughout the Cold War, something that clearly encouraged Soviet interest in arms control. The rhetoric of arms control was from the start a part of the Soviet–American arms race. However, Moscow's approach changed in important aspects over the years. Stalin did not believe in arms control or disarmament except as a useful propaganda ploy. Security could only be assured through more and better armaments, and giving them away for the promise of reciprocity on the enemy's part was the greatest folly, especially if it required control and inspections, which Stalin—and for this matter his successors all the way through Gorbachev—equated with espionage. Until the early 1960s the Soviet Union approached arms control mainly in this light, which was why the Soviet leaders advanced grand and unrealizable initiatives about complete and total disarmament.

The idea that the arms race was dangerous in its own right, and therefore had to be brought under control, only gradually carved out a place in the minds of the Soviet policy makers. Although already from the mid-1950s they talked about the destructive power of nuclear weapons, and how these weapons would end civilization when used, the Soviets perceived only the enemy's arsenal as threatening world peace, not their own. It was only in the light of bitter experience with trigger-happy allies like Mao and Castro that Khrushchev began to appreciate the risks of a 'madman' scenario or inadvertent escalation. At a fundamental level this represented a departure from a strict class mentality and was an acknowledgement that behind the façade of irreconcilable ideological dogmas the Soviets and their adversaries shared certain common weaknesses, as well as common interests in preserving peace. It would take a generation for such thoughts to mature—while arsenals grew and the arms race intensified—but this acknowledgement was a sign that the Soviet–American conflict was beginning to lose its ideological edge, a pointer to the eventual winding down of the Cold War.

8

The Cold War Arms Race
Forces Beyond the Superpowers

Vojtech Mastny

The US–Soviet arms race during the Cold War was different from other such races as it entailed a new kind of weaponry that could have made it end in total destruction. The deadly contest, however, was not solely the result of rivalry between the two nuclear-armed superpowers. It involved their allies as well as other actors and also included conventional military forces. How did both the quantitative and the qualitative asymmetries of the race determine its course over its forty-year duration?[1]

   Although the US–Soviet rivalry was the main driving force, forces beyond the superpowers fomented or mitigated it at various times. Some of those forces were impersonal, such as the lengthening lead times in the production of increasingly complex weapons systems that did not necessarily keep their acquisition in pace with the ups and downs in political developments. Others were personal in the form of influence exercised deliberately or inadvertently by both participants and outsiders. How did these forces shape the seemingly interminable race and its unexpected outcome?[2]

   The passage of time and inside evidence that has meanwhile become available make it possible to take a historical perspective and test the applicability of different theories that have been used to explain how arms races start and end. Thus the concept of the 'security dilemma', itself a product of the Cold War's initial escalation, focuses on the futility of states trying to arm for their security, only to see it diminished as other states respond in kind in vain efforts to bolster their own security. As nuclear proliferation made security more elusive, structural realists came to regard the acquisition of the 'absolute weapon' by every state as the ultimate remedy to the insecurity presumably inherent in an anarchic international system. Alternatively, in order to break the vicious circle of distrust among states that grows out of fear and hostility, theorists have proposed either daring a 'leap of trust' or engaging in GRIT—'graduated reciprocation in tension reduction'. Less subtle

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[1] Thomas Risse-Kappen, *Cooperation among Democracies: The European Influence on U.S. Foreign Policy* (Princeton NJ, 1995); John D. Duffield, *Power Rules: The Evolution of NATO's Conventional Force Posture* (Stanford CA, 1995).

[2] Matthew Evangelista, *Innovation and the Arms Race: How the United States and the Soviet Union Develop New Military Technologies* (Ithaca NY, 1988).

explanations have invoked the influence of domestic politics or 'military-industrial complex'. How useful are these constructs in explaining what actually happened?[3]

THE UNINTENDED ESCALATION, 1945–1955

Having started as a political and ideological conflict, the Cold War did not immediately provoke an arms race. Despite rising East–West hostility, neither side saw it as justifying another military build-up. Not only were US forces drastically reduced from their Second World War levels, but also we now know that the Soviet Army was demobilized much more extensively than Western governments at the time suspected. Neither did the American nuclear monopoly spur a race. The Soviet Union, to be sure, was determined to break it, but the country's ruler, Joseph V. Stalin, famously, if speciously, disparaged the Bomb as something 'meant to frighten those with weak nerves'. Stalin tried unsuccessfully to keep his country's first atomic test secret, lest it scare nervous Americans, but even after the test failed to provoke adverse reaction, the Soviet nuclear programme still did not leap forwards. Instead, Moscow drummed up a worldwide 'peace movement' to tame the enemy while waiting for the expected terminal crisis of capitalism to take effect.[4]

In the aftermath of the Second World War, additional countries were widely expected to acquire the nuclear know-how sooner or later, though not necessarily apply it to military use. But the only one that did so at that stage of the Cold War was the United Kingdom in 1947–not in 'response to an immediate military threat but rather', in the words of the official historian, as 'something fundamentalist and almost instinctive [...] feeling that atomic weapons were a manifestation of the scientific and technological superiority on which Britain's strength...must depend.' This was the kind of feeling, rather than reasoning, that would henceforth inspire most imitators.[5]

In response to the progressing Sovietization of Eastern Europe and Soviet-backed communist subversion in Western Europe, Britain also took the lead in

[3] John H. Herz, 'Idealist Internationalism and the Security Dilemma' *World Politics* 2 (1950), 157–80, and his retrospective assessment, 'The Security Dilemma in International Relations: Background and Present Problems', *International Relations* 17 (2003), 411–16; Robert Jervis, 'Was the Cold War a Security Dilemma?' *Journal of Cold War Studies* 3/1 (2001), 36–60; Alan Collins, *The Security Dilemma and the End of the Cold War* (Edinburgh, 1997); Ken Booth and Nicholas J. Wheeler, *The Security Dilemma: Fear, Cooperation, and Trust in World Politics* (Basingstoke, 2008); Richard A. Bitzinger, 'Gorbachev and GRIT, 1985–1989: Did Arms Control Succeed because of Unilateral Actions or in Spite of Them?' *Contemporary Security Policy* 15/1 (1994), 68–79; Alan R. Collins, 'GRIT, Gorbachev and the End of the Cold War', *Review of International Studies* 24/2 (1998), 201–19.
[4] Gilberto Villahermosa, 'Stalin's Postwar Army Reappraised: Déjà Vu All Over Again', *Soviet Observer* [Columbia University Harriman Institute] 2 (1990), 1–5; David Holloway, *Stalin and the Bomb: The Soviet Union and Atomic Energy, 1939–1956* (New Haven CT, 1994), 171; Vojtech Mastny, *The Cold War and Soviet Insecurity: The Stalin Years* (Oxford, 1996), 76–9.
[5] Margaret Gowing, *Independence and Deterrence: Britain and Atomic Energy, 1945–1952*, vol. 1 (London, 1974), pp. 184–5. On Britain's influence on NATO's strategy and force posture, Ian Clark and Nicholas J. Wheeler, *The British Origins of Nuclear Strategy, 1945–1955* (Oxford, 1989), and Beatrice Heuser, *NATO, Britain, France and the FRG: Nuclear Strategies and Forces for Europe, 1949–2000* (Basingstoke, 1999), 63–92.

bringing in the reluctant United States to rectify the military imbalance on the Continent. But even after Washington signed the North Atlantic Treaty of April 1949, no immediate build-up of the new alliance's military forces ensued. Created for reassurance rather than for defence, the North Atlantic Treaty Organization (NATO) initially presumed that in the unlikely case of imminent Soviet attack on France and the Low Countries, the United States, rather than its European allies, would provide the bulk of the troops needed to repel the aggressor. In view of their all-but-certain defeat, US and British contingency plans, not shared with other allies, envisaged retreating from Europe before liberating it from overseas, as in the Second World War.[6]

The Soviet Union, aware of its adversaries' plans thanks to its well-placed spies, did not find it necessary to boost its forces either, or respond by creating a similar alliance with its Eastern European satellites. True to form, Stalin instead purged their militaries, which he did not regard as trustworthy or useful enough to start with, and saturated them with loyalists, yet as late as 1950 without any significant expansion of those countries' relatively modest armed establishments or defence industries. Unbeknownst to Western analysts, Stalin's contingency plans for war were defensive rather than offensive and the forces available to execute them far below NATO's overstated 'Estimates of Soviet Strength and Capabilities'.[7]

Although the Soviet ability to penetrate the West's innermost military secrets provided Moscow with a disincentive to engage in an arms race, Western ignorance of the true condition of the enemy's military power had the opposite effect. America's European allies, growing complacent after having entrusted their security through NATO to the nuclear-armed United States, did not press for more. But Washington, having seen its nuclear monopoly broken sooner than expected, felt compelled to respond at a qualitatively higher level by announcing in January 1950 President Harry S. Truman's decision to develop a hugely destructive, if militarily unusable, hydrogen bomb. This initiated the dynamics of action and reaction—or, more precisely, 'anticipatory reaction'—of the increasingly arcane nuclear contest between the superpowers, which, however, was but one part of the larger dynamics of the evolving armed competition.[8]

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[6] Martin H. Folly, 'Breaking the Vicious Circle: Britain, the United States, and the Genesis of the North Atlantic Treaty', *Diplomatic History* 12/1 (1988), 59–77; 'Strategic Concept for the Defence of the North Atlantic Area, D.C.6/1', Gregory W. Pedlow, ed., *NATO Strategy Documents, 1949–1969* (Brussels, 1997), 57–64.

[7] Nikolai Simonov, *The Military-Industrial Complex of the USSR in the 1920s–1950s* (Moscow, 1996), 200–4; Philip A. Karber and Jerald A. Combs, 'The United States, NATO, and the Soviet Threat to Western Europe: Military Estimates and Policy Options, 1945–1963', *Diplomatic History* 22/3 (1998), 399–429; Vojtech Mastny, 'Imagining War in Europe: Soviet Strategic Planning', in Vojtech Mastny, Sven G. Holtsmark, and Andreas Wenger, eds., *War Plans and Alliances in the Cold War: Threat Perceptions in the East and West* (London, 2006), 15–45.

[8] Oleg Tsarev, 'Soviet Intelligence on British Defence Plans 1945–1950', in Lars Christian Jenssen and Olav Riste, eds., *Intelligence in the Cold War: Organisation, Role and International Cooperation* (Oslo, 2001), 53–63; David G. Coleman and Joseph M. Siracusa, *Real-World Nuclear Deterrence: The Making of International Strategy* (Westport CT, 2006), 23–7. The term in Barry Buzan, *Introduction to Strategic Studies: Military Technology and International Relations* (London 1987), 87, with his analysis of arms-racing.

Predating Truman's unwise decision, the main impetus for the final militarization of the Cold War that resulted in an unprecedented arms build-up on both sides came from Stalin's North Korean subordinate Kim Il Sung. In a classic case of the tail wagging the dog, Kim secured his master's permission to invade South Korea in spring 1950, and launched the invasion in June. Only after the aggression in Asia gave the Cold War an unequivocally military dimension did the arms race start in earnest, and its pace began to follow the shifting fortunes of the belligerents on the battlefield during the first year of the Korean War.[9]

Responding to the initial shock of the communist sweep through the peninsula, the United States' decision vastly to expand its armed forces—on the misperception that the war presaged impending Soviet attack on Western Europe—was widely welcomed there. Not so welcome was the American insistence on bolstering Europe's defence by rearming West Germany, whose chancellor, Konrad Adenauer, had become a fresh convert to the idea. France, having already devised the ingenious Schuman Plan to make war between Germany and France 'materially impossible' by enmeshing their heavy industries, introduced the Pleven Plan to build up a West German army as an integrated component of a European army. But French premier René Pleven shared CIA director General W. Bedell Smith's anxiety that the tilting correlation of forces might prompt Soviet pre-emptive action, and inquired whether Washington was capable of deterring it.[10]

The drive to instill military substance into NATO and add to it a rearmed West Germany elicited round condemnation from Moscow but otherwise no counter-action as long as the Korean War was going well for the communist side. Soviet intelligence estimates, informed by inside knowledge of the Western alliance's deliberations and shared with Eastern European leaders, showed no alarm. In conformity with Marxist-Leninist doctrine's expectation of internecine conflict among capitalist states, they concluded that 'military cooperation within the North Atlantic alliance will continue to meet with opposition by the member countries to US efforts to seize control of their military and economic potential'.[11]

Rather than anything that NATO did or did not do, the setbacks the communist forces in Korea had suffered by January 1951 prodded the Soviet Union to act. At a secret meeting with East European party and military notables at the end of that month, Stalin ordered a massive expansion of their countries' armed forces on the expectation of a war in Europe within the next three years. Soviet Marshal Konstantin Rokossovskii, installed as Poland's defence minister, pleaded in vain

[9] Thomas J. Christensen, *Worse Than a Monolith: Alliance Politics and Problems of Coercive Diplomacy in Asia* (Princeton NJ, 2011), 44–62.

[10] Marc Trachtenberg, 'America, Europe, and German Rearmament, August–September 1959: A Critique of a Myth', in Marc Trachtenberg, *The Cold War and After: History, Theory, and the Logic of International Politics* (Princeton NJ, 2012), 110–41; Melvyn P. Leffler, *A Preponderance of Power: National Security, the Truman Administration, and the Cold War* (Stanford CA, 1992), 404, 409–10.

[11] 'О деятельности органов североатлантического союза по военным приготовлениям и разногласях между странами-участицами союза по вопросу о военных обязательствах' [Activities of the Organs of the North Atlantic Alliance Related to Military Preparations and Disagreements among Member States of the Alliance on Military Commitments], December 1950, National Archives of the Czech Republic, Prague, AÚV KSČ,100/24, 92/1093, 34/41.

that the country would need at least six years to meet the required targets; nor did his Bulgarian counterpart fare any better by trying to make them contingent on Soviet help.[12]

Consequently, the Soviet bloc's economies and societies became militarized. The Hungarian Army quintupled in size, while the Czechoslovak one almost doubled. In a belated response to the Pleven Plan, Stalin also moved to create an East German army as a possible bargaining chip to avert the creation of its Western counterpart. By 1952, Poland's ballooning defence expenditures had wrecked its six-year economic plan, but as long as Stalin lived the Soviet-enforced military build-up continued unabated. The Eastern European regimes, not to mention their peoples, were hapless bystanders, quite in contrast to their Western counterparts.[13]

By 1951, US Secretary of State Dean Acheson ruefully reminisced, 'the fears of a year before had faded, as politicians and writers in Western Europe . . . question[ed] the danger from the East and the need for rearmament upon which the Americans so continually harped.' Nevertheless, NATO's February 1952 Lisbon meeting agreed on a major expansion of its conventional forces. It seemingly resolved the thorny problem of burden sharing between the United States and its European allies, but this time the Soviet assessments were right in predicting that the Lisbon goals would not be met. As the Korean War dragged on, the arms race kept roaring ahead in the East but was slowing down in the West.[14]

In February 1952, the government-sponsored US Project Vista recommended developing tactical nuclear weapons to substitute for the conventional forces NATO's European members were reluctant to supply. But only after the British provided the 'strategic rationalization' in their 'Global Strategy Paper' did Washington find merit in supplementing the unwieldy strategic weapons with large numbers of presumably more nimble tactical ones, intended for battlefield use. Ironically, the decision responded to the moral qualms of American scientists who thus hoped to avert the further development of the monstrous hydrogen bomb. The first of the new missiles arrived in Britain in the spring of 1952.[15]

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[12] Gerhard Wettig, 'Stalins Aufrüstungsbeschluss: Die Moskauer Beratungen mit den Parteichefs und Verteidigungsministern der "Volksdemokratien" vom 9. bis 12. Januar 1951', *Vierteljahrshefte für Zeitgeschichte* 53 (2005), 635–50.

[13] Imre Okváth, 'In the Shadow of the Kremlin: Hungarian Military Policy in the Early Period of the Cold War, 1945–1956', in William W. Epley, ed., *International Cold War Military Records and History* (Washington, 1996), 457–69; Condoleezza Rice, *The Soviet Union and the Czechoslovak Army, 1948–1983: Uncertain Allegiance* (Princeton NJ, 1984), 78–9; Paweł Piotrowski, 'Wojsko Polskie w czasie Wojny Koreańskiej' [The Polish Military during the Korean War], *Nowa Technika Wojskowa* I (1998), 22–9.

[14] Dean Acheson, *Present at the Creation: My Years in the State Department* (New York, 1987), 569–70; Helmut R. Hammerich, *Jeder für sich und Amerika gegen alle? Die Lastenteilung der NATO am Beispiel des Temporary Council Committee 1949 bis 1954* (Munich, 2003); 'Об итогах лиссабонской сессии Совета Северо-атлантического Союза' [The Tasks of the Lisbon Meeting of NATO], National Archives of the Czech Republic, Prague, AÚV KSČ, 100/24, 92/1093.

[15] John Baylis, 'The Evolution of NATO Strategy 1949–90', in Colin McInnes, ed., *Security and Strategy in the New Europe* (London, 1992), 95–111; Leon Sloss, and Richard N. Smith, *The Deployment of Tactical Nuclear Weapons in Europe, 1945–1955: Key Decisions and Drivers*, Occasional Paper no. 4, Nuclear History Project (McLean VA, 1997), 52; Evangelista, *Innovation and the Arms Race*, 223.

The death of Stalin in March 1953 has sometimes been regarded as a missed chance to end the arms race and even the Cold War. After all, the despot's successors quickly terminated the Korean War, reversed his decisions near the end of his life to vastly expand the Soviet Air Force and Navy, and heeded Eastern European regimes' pleas to alleviate their defence burden. Poland's 'korekta' downsized its bloated military budget, and similar reductions took place elsewhere in the region with Moscow's approval. And after NATO's decision in April 1953 to reduce the Lisbon goals, the size of its conventional forces became largely stabilized for the remainder of the Cold War—as did that of the opposing ones at much higher levels.[16]

The stabilization of conventional forces, however, did not result from negotiations nor did it apply to qualitative improvements. Moreover, the US–Soviet competition in nuclear arms technology was becoming the main driving force of the Cold War's arms race in both qualitative and quantitative terms. In May 1954 the secret Soviet decision to develop an intercontinental ballistic missile capable of reaching any target on the globe aimed to erase the American advantage in delivery vehicles. But Moscow remained undecided about following Washington's example by creating a tactical nuclear force of its own.[17]

NATO's MC 48 document of December 1954 envisaged defending Western Europe with nuclear weapons, including the tactical ones that had been arriving there in growing numbers from the United States. They were initially accepted more willingly than Washington had anticipated, because the allies expected to have a say in their use, or non-use. Their large-scale introduction wrongly assumed that the adversary had already decided to do the same. But the Soviet Union did not start their mass production until 1960, by which time the US stockpile of about 1200 warheads had multiplied more than fifteen times, thus initiating 'vertical' proliferation–a reference to the piling up of nuclear weapons by a particular country.[18]

The year 1954 marked the failure of the plan to rearm West Germany within the projected European Defence Community but also its swift replacement by the British-devised scheme to rearm the former enemy within NATO. The solution has since been interpreted as reassuring for Moscow because it would subject the future German Army to closer American supervision. Rather than reassured, however, the Soviet Union was alarmed. Although the yet-to-be formed twelve West German divisions did not change the military equation, NATO's enlargement created enough uncertainty about the future to call for a Soviet response.[19]

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[16] Tadeusz Piôro, 'W kleszczach wojennej psychozy: Obciążemia obronne Polski w latach 1950–1955' [In the Grip of a Military Psychosis: Poland's Defence Burden in 1950–1955], *Więź* [Warsaw] (1995), 140–52; Okváth, 'In the Shadow', 465.

[17] Irina Bystrova, *The Formation of the Soviet Military-Industrial Complex* (Stanford CA, 1996), 13.

[18] Marc Trachtenberg, 'The Making of the Western Defense System: France, the United States, and MC-48', in his *The Cold War and After*, 140–200; Duffield, *Power Rules*, 109, 348; Evangelista, *Innovation and the Arms Race*, 155–217; Jeremi Suri, 'America's Search for a Technological Solution to the Arms Race: The Surprise Attack Conference of 1958 and a Challenge for "Eisenhower Revisionists"', *Diplomatic History* 21/3 (1977), 417–51.

[19] Marc Trachtenberg, *A Constructed Peace: The Making of the European Settlement, 1945–1963* (Princeton NJ, 1999), 140–6; Kevin Ruane, *The Rise and Fall of the European Defence Community: Anglo-American Relations and the Crisis of European Defence, 1950–55* (Basingstoke, 2000); Saki

During the formative years of the Cold War, Western Europeans, particularly the British, had been playing a key role in trying to offset Soviet military superiority on the Continent by bringing in the United States. But neither the resulting creation of NATO, nor the American nuclear monopoly immediately spurred an arms race. Even after the Soviet Union broke the monopoly and the United States proceeded to develop the hydrogen bomb, the increase of military power on either side was modest. Only the militarization of the Cold War, intensified by the locally provoked Korean War, induced a massive build-up of conventional and nuclear forces by the superpowers and their dependants. While the West continued to lag behind in the strength of its conventional forces, Washington's decision to supplement them with large numbers of tactical nuclear weapons, welcomed by its allies, provided the critical impetus for the arms race. Why did that race continue despite Moscow's unexpected attempt to reverse it?

THE THREATENING PROLIFERATION, 1955–1968

The new Soviet leader, Nikita S. Khrushchev, attempted to demilitarize the Cold War, in the belief that his country could afford to reduce its reliance on military power because of its presumably superior ideological and economic assets. In May 1955, he caught the West off guard by offering to gradually negotiate radical reductions of both nuclear and conventional forces. Correct in suspecting that the offer was serious, not only Britain and France but also Secretary of State John F. Dulles favoured testing it. But the US joint chiefs of staff, arguing that it was 'not in the security interests of the United States to have any disarmament in the foreseeable future', prevailed in their view that it was 'better' to continue the 'arms race than to enter an agreement with the Soviets'.[20]

The 'first détente' bore fruit by leading to the neutralization of Austria, resulting in the withdrawal of all foreign forces from an area vital for NATO's north–south strategic lines of communication. But for the Soviet Union more important was to ensure that the Austrian model would not be replicated in its own strategic area. The day before the Austrian State Treaty was signed on 15 May, Moscow had preventively tightened its grip on its Eastern European dependants by imposing upon them the Warsaw Pact. A belated counterpart of NATO, the Warsaw Pact's proclamation was also intended to induce the West to negotiate away both its established alliance and the yet-to-be established Soviet one, thus downgrading the military rivalry to the Soviet Union's advantage. The scheme's predictable failure did not

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Dockrill, *Britain's Policy for West German Rearmament, 1951–1955* (Cambridge, 1991), and a revisionist account by Spencer Mawby, *Containing Germany: Britain and the Arming of the Federal Republic* (New York, 1999).

[20] Matthew Evangelista, '*Why Keep Such an Army?: Khrushchev's Troop Reductions*', Cold War International History Project Working Paper no. 19 (Washington, 1997); Antonio Varsori, 'British Policy Aims at Geneva', in Günter Bischof and Saki Dockrill, ed., *Cold War Respite: The Geneva Summit of 1955* (Baton Rouge, LA, 2000), 74–96; Richard H. Immerman, '"Trust in the Lord but Keep Your Powder Dry": American Policy Aims at Geneva', *ibid.*, 34–54.

affect Europe's military balance because it left the Warsaw Pact as little more than a 'cardboard castle' for the rest of Khrushchev's time in office.[21]

Détente in Europe had the perverse effect of stimulating arms racing in the Third World, where the Nonaligned Movement had originated in protest against the superpowers' undiminished racing after the Korean War. To help offset the setbacks the Soviet Union had suffered on the Cold War's central front, Khrushchev extended it to the periphery by providing support to states bent on expanding their arsenals to prepare for confrontation with their regional adversaries. Starting with the 1955 Egyptian arms deal, protagonists of nonalignment, such as Egypt and Indonesia, became top recipients of Moscow's military aid. At the same time, American assistance to their adversaries ensured further expansion of the arms race, notably in the Middle East, though not the benefactors' control over the beneficiaries.[22]

Even after the armed Soviet suppression of the 1956 Hungarian revolution dispelled the illusion that Moscow could reduce its reliance on force, Khrushchev tantalized the West with unilateral cuts in conventional forces, though not in nuclear ones. Gambling on their political rather than military utility, he did not try to dispel America's misperception of a 'missile gap' that placed its capacities behind those of the Soviet Union. On the contrary, during the 1956 Suez crisis, he threatened to rain on London and Paris missiles the Soviet Union did not yet have. Disillusionment with détente nourished Western European opposition to NATO's nuclearization, giving birth in Britain to the campaign for nuclear disarmament.[23]

During the Geneva test-ban talks, the Soviet Union regarded inspections as a political issue, whereas the United States considered them a technical one, changing its position in response to technological developments. The two sides nevertheless came close to an agreement. Khrushchev was reluctant to resume testing but pressure from the Soviet weapons builders and military establishment persuaded him to do so. Consequently, in 1958, both sides conducted more nuclear tests than in any other year, a total of eighty-one.[24]

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[21] Vojtech Mastny, 'The Launching of the Warsaw Pact and Soviet Grand Strategy', in Arnold Suppan, Gerald Stourzh, and Wolfgang Mueller, ed., *Der österreichische Staatsvertrag 1955: Internationale Strategie, rechtliche Relevanz, nationale Identität* (Vienna, 2005), 145–62. The metaphor quoted in Robert Spencer, 'Alliance Perceptions of the Soviet Threat, 1950–1988', in Carl-Christoph Schweitzer, ed., *The Changing Western Analysis of the Soviet Threat* (London, 1990), 9–48.

[22] Guy Laron, *Cutting the Gordian Knot: The Post-World War II Egyptian Quest for Arms and the 1955 Czechoslovak Arms Deal*, Cold War International History Project Working Paper no. 55 (Washington, 2007) Ragna Boden, 'Cold War Economics: Soviet Aid to Indonesia', *Journal of Cold War Studies* 10 (2008), 110–28; Kathryn C. Statler and Andrew L. Johns, eds., *The Eisenhower Administration, the Third World, and the Globalization of the Cold War* (Lanham MD, 2006); Jovan Čavoški, *Arming Nonalignment: Yugoslavia's Relations with Burma and the Cold War in Asia, 1950–1955*, Cold War International History Project Working Paper no. 61 (Washington, 2010).

[23] Lincoln Bloomfield, Walter C. Clemens, Jr, and Franklyn Griffiths, *Khrushchev and the Arms Race: Soviet Interests in Arms Control and Disarmament, 1954–1964* (Cambridge MA, 1966); Marc Trachtenberg, 'The Nuclearization of NATO and U.S.–West European Relations', in Marc Trachtenberg, ed., *History and Strategy* (Princeton NJ, 1991), 152–68; Philip Noel-Baker, *The Arms Race: A Programme for World Disarmament* (London, 1958).

[24] Robert A. Strong, 'Eisenhower and Arms Control', in Richard A. Melanson and David Mayers, eds., *Reevaluating Eisenhower: American Foreign Policy in the 1950s* (Urbana IL, 1987), 241–63; Oleg Grinevskij, *Tauwetter: Entspannung, Krisen und neue Eiszeit* (Berlin, 1996).

Unable to restrain the superpowers' nuclear competition, their concerned allies at least tried to restrict it geographically. This was the gist of numerous proposals for zones of disengagement, emanating from within the Soviet bloc as well as from elsewhere. The 1957 plan of the Polish foreign minister, Adam Rapacki, aimed at exempting the two German states and their neighbours from the competition, was endorsed by Moscow only after the West had rejected it. In 1958, the Berlin Crisis sidetracked the plan, but its consecutive versions continued to exert appeal in both parts of Europe.[25]

In 1957, the Soviet Union became the culprit in initiating 'horizontal' proliferation—the acquisition of nuclear weapons by additional countries—when Khrushchev, in gratitude for Chinese support against the party plotters who had tried to overthrow him, promised China to help it build the Bomb and provide a prototype two years later. In 1959, however, he abruptly ended the assistance, in Beijing's derisory criticism, as 'a presentation gift at the time the Soviet leader went to the United States for talks with Eisenhower'. But this only made the Chinese more determined to develop the Bomb on their own—'to boost our courage and scare others', as their supreme leader Mao Zedong rationalized it.[26]

The escalation of the Berlin Crisis fuelled the arms race. To show firmness, the incoming administration of President John F. Kennedy in 1961 expanded the deployment of US strategic missiles, even while knowing that the feared missile gap did not exist, and demonstratively sent troops to the divided city on a trip-wire mission. Khrushchev, before giving up on achieving the kind of German settlement he wanted, tried to compensate by resuming nuclear testing, including the detonation of the biggest hydrogen bomb ever. Having come perilously close to a clash without bringing disarmament any closer, the superpowers now felt compelled to pay more attention to their critics.[27]

As the Soviet testing threatened to be reciprocated by the United States, the nonaligned summit in Belgrade called for a world conference on disarmament, and had India's Prime Minister Jawaharlal Nehru travel to Moscow to press the message. Although he returned empty-handed, by the end of the year the superpowers had agreed to co-sponsor under UN auspices the Eighteen Nation Disarmament

[25] Eugène Hinterhoff, *Disengagement* (London, 1959) counts as many as 117 proposals. On the origins and impact of the Rapacki Plan, Józef Winiewicz, *Co pamiętam z długej drogi życia* [Memories of My Long Lifetime] (Poznań, 1985), 552; Teresa Łós-Nowak, *Polskie inicjatywy w sprawie broni nuklearnej w Europie środkowej, 1957–1964* [Polish Initiatives on Nuclear Weapons in Central Europe] (Wrocław, 1989), and Ulrich Albrecht, 'The Political Background of the Rapacki Plan of 1957 and Its Current Significance', in Rudolf Steinke and Michael Vale, eds., *Germany Debates Defense: The NATO Alliance at the Crossroads* (Armonk NY, 1983).

[26] John W. Lewis and Xue Litai, *China Builds the Bomb* (Stanford CA, 1988), 211, 266; Shen Zhihua and Yafeng Xia, *Between Aid and Restriction: Changing Soviet Policies toward China's Nuclear Weapons Programme: 1954–1960*, Nuclear Proliferation International History Project Working Paper No. 2 (Washington, 2012).

[27] Desmond Ball, *Politics and Force Levels: The Strategic Missile Program of the Kennedy Administration* (Berkeley CA, 1980); Petr Luňák, 'Khrushchev and the Berlin Crisis: Soviet Brinkmanship Seen from Inside', *Cold War History* 3/2 (2003), 53–82, and Frederick Kempe, *Berlin 1961: Kennedy, Khrushchev, and the Most Dangerous Place on Earth* (New York, 2011).

Committee (ENDC), including in it not only equal numbers of members from their own alliances but also countries broadly representative of the Third World. The UN further internationalized the nonproliferation issue by putting it on the committee's agenda, after the UN General Assembly had passed unanimously a resolution introduced by Ireland, which revived the 1958 proposal by its foreign minister, Frank Aiken.[28]

A former terrorist turned pragmatist, Aiken had drafted the prototype of what later became the Nonproliferation Treaty (NPT). It did not call for disarmament by the superpowers as the necessary prerequisite for preventing the further spread of nuclear weapons. Rather than pursuing the elusive goal of their abolition, it insisted on a system of safeguards and inspections to minimize the risk of countries rushing to seek safety in their possession. It was none too soon to try preventing the rush, after France had already become the fourth nuclear power and China was expected to be the fifth.[29]

France ostentatiously excluded itself from the ENDC. It regarded the possession of nuclear weapons, though not necessarily in large numbers, as an indispensable attribute of a great power. Boasting that 'our bomb will change the ideas of many', French President Charles de Gaulle welcomed its possible possession by additional countries as a safeguard against its abuse by the superpowers. So did China, whose Premier Zhou Enlai maintained that 'if all countries had nuclear weapons, the possibility of nuclear wars would decrease'.[30]

By 1962, the rising Sino-Soviet confrontation was spreading appetites to possess nuclear weapons. Mao's emissary Deng Xiaoping insinuated to China's Albanian allies that proliferation could stop 'when more socialist countries are in possession of nuclear weapons and when they have absolute superiority over the imperialist countries'. The Albanians would then infuriate Moscow by needling it to help all Warsaw Pact states go nuclear. When Beijing in turn became infuriated by Moscow's readiness to support the NPT, the North Korean foreign minister lost no time nagging the Soviet ambassador that the Soviet Union should help both China and his own country to get the weapons, lest South Korea, Taiwan, and South Vietnam get them first with American help.[31]

It was under growing Chinese pressure that Khrushchev embarked on his harebrained scheme to save Cuba's revolution by surreptitiously placing nuclear-armed

[28] Dimitris Bourantonis, *The United Nations and the Quest for Nuclear Disarmament* (Aldershot, 1993), 65–9, and M. Samir Ahmed, 'The Role of Neutrals in the Geneva Negotiations', *Disarmament and Arms Control* 1/1 (1963), 2–32.

[29] Richard Sinnitt, 'Ireland and the Diplomacy of Nuclear Non-Proliferation: The Politics of Incrementalism', *Irish Studies in International Affairs* 6 (1995), 59–78.

[30] De Gaulle quoted in Jeremi Suri, *Power and Protest: Global Revolution and the Rise of Détente* (Cambridge MA, 2003), 53; Zhou in Chen Jian, 'Departing Revolution: China's Changing Nuclear Policies during the Cold War', in Olav Njølstad, ed., *Nuclear Proliferation and International Order: Challenges to the Non-proliferation Treaty* (London, 2011), 227–47.

[31] Deng Xiaoping, 19 June 1962, *Cold War International History Project Bulletin* 16 (2007–2008), 238. Albanian note to Political Consultative Committee, 15 January 1965, in Vojtech Mastny and Malcolm Byrne, eds., *A Cardboard Castle? An Inside History of the Warsaw Pact, 1955–1991* (Budapest, 2005), 177–8; Sergei Radchenko, *Two Suns in the Heavens: The Sino-Soviet Struggle for Supremacy, 1962–1967* (Stanford CA, 2009), 75–6.

missiles on the island. Only recently has it become known that Cuba almost became a nuclear power itself—the country whose leader, Fidel Castro, at the peak of the crisis shocked Khrushchev by advocating actually using the nuclear-tipped missiles already installed on the island should the United States attempt to invade it, offering to sacrifice his own people for the common cause. After the crisis had seemingly passed, Khrushchev's troubleshooter Anastas Mikoyan still had to use subterfuge to prevent Castro from laying hands on the tactical missiles that, unlike the strategic ones, had been left in Cuba unbeknownst to the Americans.[32]

Regardless of the thaw that followed the brush with disaster, the NPT languished because of the overheated dispute about NATO's nuclear sharing, which never seriously threatened to lead to proliferation. The United States was determined not to turn over its nuclear weapons to anyone, nor did its allies other than Britain and France crave them. In the crucial case of West Germany, distaste for them was such that any government favouring their acquisition risked being voted out of power. Rather than by sharing them, Washington eventually defused the issue by sharing plans for their possible (though actually increasingly improbable) use through NATO's newly established Nuclear Planning Group.[33]

There is no evidence that Moscow's European allies, other than the wayward Albania, desired the weapons either. Nor was Moscow, wiser by its Chinese and Cuban experiences, ready to share them with any allies. Khrushchev, while beating the dead horse of West German militarism, was not beyond posturing that it might. Toward the end of his rule, however, he appalled Polish and East German leaders by his apparent readiness for a deal with NATO. According to the Polish party chief, Władysław Gomułka, he 'truly believed that the creation of NATO nuclear forces would not change the balance of forces' and, with reference to China, might even 'be helpful in preventing the proliferation of nuclear weapons'.[34]

After Khrushchev's fall from power in October 1964, which coincided with China's first nuclear test, continued standoff between the superpowers allowed for a wide-ranging discussion in the ENDC, which turned out to be more representative of diverse interests than its original sponsors had bargained for. Moscow's nominal ally Romania became most aggressive, figuring that 'if a large majority of countries did not sign the treaty, then the nuclear powers would be forced to take into consideration their opinions'. On the NATO side, Canada cast itself in a mediating role 'akin to that of a nursing assistant rather than as one of the obstetricians',

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[32] Aleksandr Fursenko and Timothy Naftali, '*One Hell of a Gamble': Khrushchev, Castro, and Kennedy, 1958–1964* (New York, 1997), 272–3; Svetlana Savranskaya, 'The Soviet Cuban Missile Crisis: Documents on Anastas Mikoyan's November 1962 Trip to Cuba', *Cold War International History Project Bulletin* 17–18 (2012), 331–48.

[33] Christoph Hoppe, *Zwischen Teilhabe und Mitsprache: Die Nuklearfrage in der Allianzpolitik Deutschlands* (Baden-Baden, 1993).

[34] Record of meeting of Polish party central committee, 20–21 November 1964, http://digital-archive.wilsoncenter.org/document/112670; Douglas Selvage, *The Warsaw Pact and Nuclear Nonproliferation, 1963–65*, Cold War International History Project Working Paper No. 32 (Washington, 2001), 14–15.

whereas Italy, the weakest of the Western group, tried to use the opportunity to advance its status within the alliance.[35]

During the time the NPT was being negotiated, crucial decisions for or against going nuclear were taken, which set the further course of proliferation. When the ENDC started, more than a dozen additional countries were widely believed to be on the verge of going nuclear; by the end of the decade, all the European states that had been entertaining the idea had abandoned it. Sweden went so far as to anchor its decision in an act of parliament. In Latin America, Cuba's attempted introduction of Soviet nuclear weapons into the neighbourhood prompted a Mexican initiative that resulted in a treaty that made the region the first nuclear-free zone, later to be imitated elsewhere in the world.[36]

In contrast, South Asia became an arms race zone in the making after India, the ENDC's most vociferous advocate of nuclear abstinence, secretly initiated a programme aimed at acquiring nuclear weapons capability. Rather than to the Chinese bomb, the programme responded to the professional ambitions of the country's nuclear scientists, who were able to move ahead because of the government's indecision amid clamour by the political class to get the weapon after India's inconclusive war with Pakistan in 1965. Pakistani scientists had similar ambitions and one of them later regretted that 'we lost several long years' because the country's military ruler did not buy the argument of his civilian foreign minister, Zulfikar Ali Bhutto, that 'a nuclear India would further undermine and threaten our security, and [that] for our survival, we needed a nuclear deterrent'. But in due time, Bhutto would have his way.[37]

In 1967, Taiwan considered a project to build its own nuclear deterrent, but Washington nipped it in the bud. Japan, in deference to its pacifist public opinion, adopted in the same year its 'Three Nuclear Principles' banning the production, possession, and any other introduction of nuclear weapons into the country. And while Israel, shortly before its victory in the Six-Day War, had decided to build the Bomb, Egypt abandoned its incipient programme after its defeat in the war, thus averting a looming nuclear arms race in the Middle East. To sum up, by the time the NPT was concluded in July 1968, horizontal proliferation had been reversed.[38]

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[35] Record of Ceaușescu-Mehta conversation, 16 September 1967, Central Committee of Romanian Communist Party Foreign Relations Department Collection, National Archives of Romania, Bucharest, file 77/1967, 2–6; Carl Ungerer, 'Influence without Power: Middle Powers and Arms Control Diplomacy during the Cold War', *Diplomacy and Statecraft* 18/2 (2007), 393–414. Leopoldo Nuti, *La sfida nucleare: La politica estera italiana e le armi atomiche 1945–1991* [The Nuclear Challenge: Italian Foreign Policy and Nuclear Arms] (Bologna, 2007), 287–345.

[36] Mónica Serrano, *Common Security in Latin America: The 1967 Treaty of Tlatelolco* (London, 1992).

[37] George Perkovich, *India's Nuclear Bomb: The Impact on Global Proliferation* (Berkeley CA,1999), 111–12, 121–3; Munir Ahmad Khan, 20 March 1999, http://www.nuclearfiles.org/menu/key-issues/nuclear-weapons/issues/policy/pakistani-nuclear-policy/munir%20ahmad%20khan's%20speech.html; Feroz Khan, *Eating Grass: The Making of the Pakistani Bomb* (Stanford CA 2012), 33–49.

[38] David Albright and Corey Gay, 'Taiwan: Nuclear Nightmare Averted', *Bulletin of the Atomic Scientists* (1998), 54–60; Kurt M. Campbell and Tsuyhoshi Sunohara, 'Japan: Thinking the Unthinkable', in Kurt M. Campbell, Robert J. Einhorn, and Mitchell B. Reiss, eds., *The Nuclear Tipping Point: Why Nations Reconsider Their Nuclear Choices* (Washington D.C., 2004), 218–53; Avner Cohen, *Israel and the Bomb* (New York, 1999), 273–6; Maria Rost Rublee, *Nonproliferation Norms: Why States Choose Nuclear Restraint* (Athens GA, 2009), 109–11.

The reversal, to be sure, did not resolve the proliferation problem. But it disproved notion that states' yearning for the Bomb was universal rather than exceptional. Moreover, the NPT's system of safeguards and inspections, imperfect as it was, provided disincentives that made proliferation politically more costly and technically more difficult. While the Cold War was in progress, however, it was not so much horizontal proliferation as the vertical kind that invited criticism of the guarantees offered by the superpowers under the treaty as 'pretended' and 'misbegotten'.[39] Why did their arms race not wind down despite the onset of East–West détente?

THE DECEPTIVE STABILIZATION, 1968–1985

A week before the NPT was signed, NATO's 'Reykjavik signal' indicated its readiness to negotiate mutual force reductions in Europe, eliciting Moscow's favourable response. Two months later, the Soviet invasion of Czechoslovakia delayed the ratification of the treaty and also put NATO's pending force reductions on hold, but the alliance did not conclude that the Soviet action upset the East–West balance. What the operation did do, having both caught NATO by surprise and revealed Soviet weaknesses, was expose how unprepared both sides were for the war they had been planning to wage.

Once détente dawned, defusing the military confrontation took precedence before curbing the growth of the nuclear arsenals. The decline of the anti-nuclear movement indicated how much détente came to be trusted. The originally Soviet-proposed project for a Conference on Security and Cooperation in Europe (CSCE) became a test of détente's ability to mitigate the East-West confrontation. Designed to include all European countries while excluding arms control negotiations, the CSCE gave not only NATO's smaller members but also disaffected members of the Warsaw Pact an unexpected opportunity to contest the management of the military competition by the superpowers.

Behind the closed doors of Warsaw Pact gatherings, Romania pressed for including disarmament in the CSCE's agenda. Poland annoyed Moscow by advocating a step-by-step regional disarmament that would lead to a freeze and eventual removal of all nuclear weaponry from Europe, describing this as a matter occasioning a 'great deal of interest among small states' on both sides of the ideological divide. Hungary's foreign minister commended the idea in a joint statement with his Belgian counterpart. As the East–West debate about the thrust of the proposed conference shifted toward the contentious issue of human rights, however, the credibility of Eastern Europe's communist regimes as advocates of disarmament suffered, and the Soviet Union managed to thwart their initiatives.[40]

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[39] Alva Myrdal, *The Game of Disarmament: How the United States and Russia Run the Arms Race* (Manchester, 1977), 171.

[40] Wanda Jarząbek, *Hope and Reality: Poland and the Conference on Security and Cooperation in Europe, 1964–1989*, Cold War International History Project Working Paper No. 56 (Washington, 2008); report on meeting of Warsaw Pact deputy foreign ministers on 26–27 January 1970, http://www.php.isn. ethz.ch/collections/colltopic.cfm?lng=en&id=17267&navinfo =15700; Vincent Dujardin, 'Belgium,

America's European allies, who perceived the arms race as a symptom rather than the cause of their insecurity, believed that East–West political relations could and should improve first. This would gradually reduce the relevance of the military rivalry and with it also the danger inherent in the accumulated military hardware. The United States, predisposed to conceive of the Cold War in mainly military terms and beholden to the mechanistic doctrine of deterrence, assumed the race could be brought under control without resolving the underlying political issues: 'SALT can represent a realization of the pursuit of a safer world order even during continuation of political conflict,' State Department analyst Raymond Garthoff wrote to Washington from the NATO headquarters after the Strategic Arms Limitation Talks had opened.[41]

As the talks proceeded separately from preparations for the CSCE, arms control became largely insulated from political developments. Concerned about Washington negotiating with Moscow over their heads, NATO's European allies took the lead in trying to turn the Soviet CSCE project to their advantage. More suspicious of the project than they were, the United States made its consent contingent on Soviet acceptance of the MBFR—the 'mutual and balanced force reductions' talks concerning conventional forces, which would centre on Europe and include each other's allies. The Western allies were reserved, suspicious that tampering with the military balance might be destabilizing.

The Soviet Union welcomed détente, but conceived of it as the continuation of international class struggle by another name. It wanted to slow down the arms race, but never found the time right to act on this wish. In January 1972, Soviet leader Leonid I. Brezhnev, in a secret speech to the Warsaw Pact allies, estimated that West Europeans had become less dependent on the United States, but also less inclined to favour arms reductions than Washington was. He argued that they needed to be convinced by a 'military détente', which should allow for ending the arms race but prevent the West from gaining military superiority. He professed a desire for arms reductions and disengagement, but concluded that 'unfortunately' the situation was such that 'we haven't been able to do it yet'.[42]

Forces beyond Europe continued to influence the arms race. The escalating Sino-Soviet hostility had predated the Sino-American rapprochement but accelerated after it. Moscow's concern was not so much China's modest nuclear arsenal as the size of its conventional forces. As the Soviet Union was preventively building up its forces in Asia, the Chinese tried to discourage NATO from reducing forces in Europe, lest Soviet troops be moved from there to the Chinese border. At the same time, presumably to correct the Soviet–Chinese imbalance of forces, Moscow

NATO, and Détente, 1960–1973', in Christian Nuenlist and Anna Locher, eds., *Transatlantic Relations at Stake: Aspects of NATO, 1956–1972* (Zurich, 2006), 189–214.

[41] Raymond L. Garthoff, *A Journey through the Cold War: A Memoir of Containment and Coexistence* (Washington D.C., 2001), 244–5.

[42] Speech by Brezhnev, 25 January 1972, Hungarian National Archives, http://www.php.isn.ethz.ch/collections/colltopic.cfm?lng=en&id=18122&navinfo=14465.

secretly expanded its biological weapons programme, in violation of the convention prohibiting their production that it had signed in 1972.[43]

The Sino-American rapprochement did not affect the military balance in Europe, where the number of US nuclear warheads peaked in 1971 at about 7,300. But the conflict in the Middle East, where Moscow's Arab clients fomented an arms race with Israel, had important consequences for Europe. While driving a Soviet naval build-up in the Mediterranean, which challenged NATO in its own backyard, it also provoked the 1973 Yom Kippur War, which tolled the bell for American–Soviet détente. Washington's rush to resupply Israel while Moscow rushed to restock the Arab arsenals, together with the 1973 oil embargo, gave rise to European Political Cooperation, intended 'to make an original contribution to the international equilibrium'. A European Community project, it defined itself by opposing the East–West military competition as both futile and dangerous, even while acknowledging dependence on NATO for defence.[44]

In the latter part of the 1970s, the superpowers' competitive support for their increasingly independent Third World clients doomed their détente. India became the world's largest importer of arms, mainly Soviet, after its 1972 war with Pakistan, which had been supplied by the United States and China. Cuba's daring military intervention in Angola in 1975 prompted the Soviet Union to back it up by providing arms supplies, and four years later Moscow did not wait to be prompted before colluding with Cuba in airlifting weapons to help install military rebels who had toppled the pro-American government in Ethiopia. As rivals in the Horn of Africa jockeyed for support by either superpower, détente became 'buried in the sands of the Ogaden'.[45]

The arms race in Europe followed its own dynamics. Once the 1975 Helsinki agreement set in motion the CSCE process, with confidence-building measures as its sole military ingredient included mainly thanks to insistence by European neutrals, the time seemed to have come for the MBFR to move forward. But by then the arms race had made the situation different from that in the earlier stages of the Cold War. While both sides wanted to downsize their conventional forces, NATO's underestimation of the Soviet ones inadvertently blocked progress, as Moscow was reluctant to admit that the numbers were much higher. It may have been prepared to cut its larger forces, but after NATO proposed asymmetrical reductions and offered unilaterally to dismantle some of its missiles as an incentive, the Soviet Union responded by proposing proportional reductions. Rather than trying to offset the Warsaw Pact's numerical preponderance, NATO then

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[43] Milton Leitenberg and Raymond A. Zilinskas, *The Soviet Biological Weapons Program: A History* (Cambridge MA, 2012), 50–78.

[44] Robert S. Norris and Hans M. Kristensen, 'U.S. Nuclear Weapons in Europe, 1954–2004', *Bulletin of the Atomic Scientists* 60/6 (2004), 76–7; 'Second Report on European Political Cooperation on Foreign Policy', 23 July 1973, in James Mayall and Cornelia Navari, eds., *The End of the Post-War Era: Documents on Great Power Relations, 1968–1975* (Cambridge MA, 1980), 449–58.

[45] Zbigniew Brzezinski, *Power and Principle: Memoirs of the National Security Adviser, 1977–1981* (New York, 1985), 189.

increased its spending on qualitative improvements, which made agreement even more difficult.[46]

Behind the closed doors of Romania's Politburo, the country's ruler, Nicolae Ceaușescu, and his acolytes blamed squarely 'Soviet militarist circles that pursue a policy of excessive armament […] involving the states participating in the Warsaw Treaty in a dangerous arms race and having them bear the cost of this adventurous way of acting'. The Romanians fumed that 'to stimulate the arms race, and to stimulate NATO to do the same thing' is irresponsible, but at least 'NATO's decision is public while ours is secret'.[47] But to put it precisely, the main driver of the race was nuclear rather than conventional, as well as increasingly impersonal.

The lengthening lead times of increasingly complex nuclear programmes, which predated détente, made the nuclear arms race disconnected from détente's trajectory. Some Western observers could see the development of the Soviet SS-20 intermediate-range missiles, which coincided with the onset of détente, as resulting from 'the inertia of past requirements'. But others would agree with the insight offered later by Poland's General Wojciech Jaruzelski that it was a 'desperate attempt to somehow compensate for the West's ever more obvious superiority in advanced technology'.[48]

The SS-20s were destabilizing not only because they would cover all of Europe and NATO had no equivalent, but also because they added to doubts about the United States' readiness to risk an attack on its home territory to defend that of its allies. Hence the main opposition to the planned withdrawal of American land-based missiles from Europe and their replacement by sea-based missiles came primarily, though not exclusively, from West Germany as the country that was most exposed. German, British, and Norwegian officers took the lead in negotiating NATO's dual-track decision, which would bring the arms race to an even higher level by reciprocating the Soviet build-up unless the SS-20s were removed. And France's President Valéry Giscard d'Estaing was the person who clinched the decision at the alliance's Guadeloupe summit in January 1979—two weeks before the Soviet invasion of Afghanistan heralded the onset of the 'Second Cold War'.[49]

The time from the decision to its implementation four years later demonstrated how the two alliances' quest for nuclear balance unbalanced them. At the 1980 anniversary meeting of the Warsaw Pact, Brezhnev faulted the West for trying to upset the presumably existing equilibrium. But this did not deter Ceaușescu from clamouring for across-the-board cuts in the alliance's defence spending, deep mutual

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[46] Christoph Bluth, 'Arms Control as a Part of Strategy: The Warsaw Pact in MBFR Negotiations', *Cold War History* 12 (2012), 245–68.

[47] Minutes of meeting, 24 November 1978, National Archives of Romania, http://www.php.isn.ethz.ch/collections/colltopic.cfm?lng=en&id=16633&navinfo=14465.

[48] Michael K. MccGwire, *Military Objectives in Soviet Foreign Policy* (Washington D.C., 1987), 510; Wojciech Jaruzelski, *Mein Leben für Polen: Erinnerungen* (Munich, 1993), 201.

[49] Leopoldo Nuti, 'The Origins of the 1979 Dual Track Decision—A Survey', in Leopoldo Nuti, ed., *The Crisis of Détente in Europe: From Helsinki to Gorbachev, 1975–1985* (London, 2009), 57–71; Kristina Spohr Readman, 'Conflict and Cooperation in Intra-Alliance Nuclear Politics: Western Europe, the United States, and the Genesis of NATO's Dual Track Decision, 1977–1980', *Journal of Cold War Studies* 13/2 (2011), 39–89.

reductions of forces, and the departure of all foreign troops from the Continent. On the NATO side, Denmark, having failed in its efforts to delay the dual-track decision, distanced itself from its alliance by adopting the practice of attaching dissenting footnotes to NATO resolutions. Social democratic politicians from the Nordic countries joined those from the Low Countries in forming the 'Scandilux' group of experts to prevent counter-deployments.[50]

As the Geneva arms control talks failed to produce results, the perils inherent in the arms race increased. This was not because of the later senzationalized Able Archer incident in November 1983, when a NATO exercise unwisely used encryption to simulate a nuclear attack on the Soviet Union, which could have been misread for a real one and provoked a pre-emptive strike. In the event, no alarm bell rang in the Kremlin and the event went unnoticed. But on a growing number of other occasions the multiplicity of weapons on hair trigger multiplied the chances of false alarms that could have led to their accidental release.[51]

The month before the incident, NATO's Montebello meeting had wisely announced a decision to decrease the number of its tactical nuclear weapons, made obsolete because of technological improvements—the step that would soon reduce their stockpile to the lowest level in more than twenty years. But the Soviet Union, heading toward losing the technological race, was not prepared to reciprocate: 'All the missiles that we planned to install should be installed,' defence minister Dmitrii F. Ustinov informed the party Politburo as NATO was about to deploy its 'euromissiles' at the end of November. Once the deployment started, and the Soviet Union lived up to its promise to walk out of the Geneva talks, no bilateral arms control forum remained. The multilateral Stockholm conference on disarmament under CSCE's auspices was the only one to address the subject, but no sooner did it open than it stalled.[52]

The revitalized mass peace movement in Western Europe did not stop the NATO deployments. Neither did the joint effort by the Warsaw Pact's most liberal and most conservative regimes, Hungary's and East Germany's respectively, succeed in their effort at 'damage limitation'—the damage magnified by imposed Soviet counter-deployments in Central Europe. In the UN, post-Mao China vainly urged both superpowers to make 'three halts'—those of testing, improving, and manufacturing nuclear weapons—and one cut: 50 per cent of their warheads. The 1985 Delhi Declaration of six nations, including NATO member Greece,

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[50] Stenographic record of Warsaw Pact meeting, 14–15 May 1980, http://www.php.isn.ethz.ch/collections/colltopic.cfm?lng=en&id=18312&navinfo=14465; Nikolaj Petersen, '"Footnoting" as a Political Instrument: Denmark's NATO Policy in the 1980s', *Cold War History* 12/2 (2012), 295–317, and his 'The Scandilux Experiment: Towards a Transnational Social Democratic Security Perspective', *Cooperation and Conflict* 20/1 (1985), 1–22.

[51] Vojtech Mastny, 'How Able Was "Able Archer"? Nuclear Trigger and Intelligence in Perspective', *Journal of Cold War Studies* 11/1 (2009), 108–23. The most detailed study, by Dmitry Adamsky, 'The 1983 Nuclear Crisis: Lessons for Deterrence Theory and Practice', *Journal of Strategic Studies* 36/1 (2013), 4–41, draws conclusions from what could have happened if the incident had been misread by the Soviet leadership.

[52] Montebello decision, 27 October 1983, http://www.nato.int/cps/en/natohq/official_texts_23221.htm?. Minutes of Politburo meeting, 31 May 1983, *Cold War International History Project Bulletin* 4 (1994), 77–81.

against an arms race in outer space and further nuclear testing asserted that 'progress in disarmament can only be achieved with an informed public applying strong pressure on Governments'.[53]

As détente had risen and fallen, more outside pressure had been applied on the superpowers than before. But the pressure by disgruntled Soviet allies had been ineffective, whereas the success of America's NATO allies in pushing through the dual track decision had expanded the arms race. The piling up of Soviet and US weaponry by some of the superpowers' Third World clients had a similar effect. Yet neither superpower had a policy to terminate the race, nor did any theory anticipate how it could be terminated. Why did it nevertheless start subsiding in 1985, leading to the Cold War's unexpected peaceful resolution?

THE UNEXPECTED TERMINATION, 1985–1991

Even as Washington's policy stayed on course, Moscow's was changing, albeit more accidentally than intentionally. The rise to power of so improbable a Soviet leader as Mikhail S. Gorbachev was not predetermined and the decisive developments that determined his actions or inaction were unpredictable. Contemporary evidence does not substantiate the retrospective view that he had a clear concept, much less a coherent policy, of how to end the military competition he had inherited from his predecessors. Indeed, like them, he initially hailed the 'military and strategic balance with NATO' as 'historic', while accusing the West of threatening it by striving for superiority. At the same time, he was unable to prevent his country's secret biological weapons programme from not only continuing but also expanding because of resistance and deception by the Soviet military.[54]

Unlike his predecessors, Gorbachev was open to unconventional ideas. Shortly after he took office, he impressed the visiting architect of West Germany's *Ostpolitik*, Egon Bahr, by his interest in the innovative notions of security that, developed by the Western European Left in vain efforts to influence NATO, now began to influence its previously unresponsive Soviet adversary. Attracted to such concepts as 'reasonable defensive sufficiency' and 'structural inability to attack', Gorbachev dismissed both nuclear and conventional superiority as meaningless and deterrence as dangerous. He described 'the task of ensuring security [as] increasingly . . . a political task . . . [that] can only be resolved by political means'. His understanding that security could not be absolute, but had to be mutual and could not be enhanced at the cost of someone else's insecurity

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[53] Ronald Asmus, *East Berlin and Moscow: The Documentation of a Dispute* (Munich, 1985); Bates Gill, 'Two Steps Forward, One Step Back: The Dynamics of Chinese Nonproliferation and Arms Control Policy-Making in an Era of Reform', in David Lampton, ed., *The Making of Chinese Foreign and Security Policy in the Era of Reform* (Stanford CA, 2001), 257–88; Ministry of External Affairs, *Delhi Declaration* (New Delhi, 1985).
[54] Speech by Gorbachev at Warsaw Pact summit, 26 April 1985, in Mastny and Byrne, *A Cardboard Castle?*, 507–10; Leitenberg and Zilinskas, *The Soviet Biological Weapons Program*, 563–630.

or 'built forever on a fear of retribution' reflected Swedish Prime Minister Olof Palme's concept of 'common security'.[55]

In trying to win West European support for the demilitarization of the Cold War and make the incredulous Americans cooperate, Gorbachev evoked his notion of a 'common European home'—a home, as he told the British Parliament, not a 'theatre of operations'. The concept, which implied overcoming the division of Europe, was designed as a tactic but assumed strategic significance once the Soviet leader, genuinely impressed by the progress of Western European integration, started striving to make his country qualify as a *bona fide* inhabitant of the common home. The resumption by the Soviet Union of the Geneva talks and its unilateral cessation of the further deployment of the SS-20s as well as of nuclear testing was to serve, as he explained to the Warsaw Pact allies, to outmanoeuvre the United States with Western European help, and frustrate Washington's scheme to race the Soviet Union to exhaustion.[56]

While Gorbachev's ascendancy provided new opportunities for outside forces to influence the Soviet military posture even in the absence of an American response, the potential for change only started being realized after the March 1986 Chernobyl nuclear accident provided an additional impulse. Within a year, Gorbachev proved by his deeds that his verbal commitment to disarmament was genuine. Soviet concessions brought the Stockholm conference to a successful conclusion, resulting in a multilateral agreement to mitigate and prevent the dangers of the arms race by 'confidence and security building measures'. If 'at the beginning of the conference the Soviets used it to try to convince the Western public opinion of NATO's responsibility for the crisis in disarmament efforts . . . during its third year they convinced Western governments that "new thinking" on military security would finally make progress possible'.[57]

Personalities could have made a difference when at their 1986 Reykjavik summit Gorbachev and Reagan found each other to be fellow nuclear abolitionists, and almost reached an agreement about getting rid of nuclear weapons in Europe. Conceivably, the arms race might have been ended then and there if they had not met with opposition from within—from Washington hardliners—as well as from without. Western European governments and the majority of their publics, unlike the minority peace movement, were not ready to take the risk of Europe's denuclearization. British Prime Minister Margaret Thatcher feared that

[55] Egon Bahr, *Zu meiner Zeit* (Berlin, 1996), 515–16; Gorbachev quoted in Raymond L. Garthoff, *The Great Transition: American-Soviet Relations and the End of the Cold War* (Washington D.C., 1994), 528, and in John W. Parker, *Kremlin in Transition*, vol. 2: *Gorbachev, 1985–1989* (Boston MA, 1991), p. 83; Andrey A. Kokoshin and Vladimir V. Larionov, 'The Confrontation of Conventional Forces in the Context of Strategic Stability.' in Anders Boserup and Robert Neild, ed., *The Foundations of Defensive Defense* (New York, 1990), 31–43.

[56] Marie-Pierre Rey, '"Europe Is Our Common Home": A Study of Gorbachev's Diplomatic Concept', *Cold War History* 4/2 (2004), 33–65; quote in Garthoff, *The Great Transition*, 587; Speech by Gorbachev at Warsaw Pact meeting in Sofia, 22 October 1985, http://www.php.isn.ethz.ch/collections/colltopic.cfm?lng=en&id=15837&navinfo=14465.

[57] Stefan Lehne, *The Vienna Meeting of the Conference on Security and Cooperation in Europe, 1986–1989: A Turning Point in East-West Relations* (Boulder CO, 1991), 28.

the acceptance of Soviet conventional superiority would render her country's nuclear deterrent useless.[58]

After Reykjavik, Gorbachev travelled to India to meet another soul mate, Prime Minister Rajiv Gandhi, co-author of the Delhi Declaration. The two visionaries issued the impressive 'Declaration of Principles of a Nuclear-Weapon-Free and Non-Violent World', which called for a nuclear-free world by the year 2000 and anticipated with remarkable accuracy the international security agenda of the next century. But at the same time Gandhi—who publicly rejected the notion that ' "terror" balanced or otherwise would stabilize anything' and, referring to his country's rivalry with Pakistan, warned that 'a nuclear arms race in the subcontinent would only subject both our peoples to the worst possible fate on earth'—yielded to pressure by his country's strategic establishment to secretly authorize the production of a nuclear bomb. With Pakistan busy developing one as well, the arms race thus accelerated in South Asia just as it was being reversed in Europe.[59]

The turning point was reached in February 1987, when Gorbachev de-linked the INF negotiations on intermediate-range nuclear forces from other arms control issues. This cleared the way toward the conclusion (later that year) of a treaty that, for the first time, reversed rather than merely slowed the US–Soviet nuclear arms race in at least one category of weapons. The treaty was not universally welcome in Western Europe. Thatcher 'had gone along with it in the hope that the Soviets would never accept' it and French defence minister André Giraud likened it to 'another Munich'. Although his superior, President François Mitterrand, rejected the metaphor as 'grotesque', France continued to resist reductions of any missiles other than strategic.[60]

The INF treaty did not end the qualitative arms race, driven by the progressing modernization of the Western arsenals, particularly Washington's push for the deployment of the more efficient short-range Lance missiles. The Warsaw Pact's supreme commander, General Petr G. Lushev, estimated that by 2000 NATO's firepower would double. The Soviet military, while reluctantly implementing the restructuring and reduction of forces decided by Gorbachev in 1987, continued to call for their speedy modernization. West Germany's secret 'Political Guidelines for Defence' of 1987 saw no end to an accelerating build-up.[61]

Ironically, the most radical disarmament initiatives emanated at that time from Eastern Europe's embattled communist regimes. Encouraged by Gorbachev to rely

[58] George P. Shultz et al. eds., *Reykjavik Revisited: Steps toward a World Free of Nuclear Weapon*s (Stanford CA, 2008); Michael Howard, 'A European Perspective on the Reagan Years', *Foreign Affairs* 75 (1987–88), 478–93; Margaret Thatcher, *The Downing Street Years* (London, 1993), 482.

[59] Vojtech Mastny, 'The Soviet Union's Partnership with India', *Journal of Cold War Studies* 12/3 (2010), 50–90.

[60] Thatcher, *The Downing Street Years*, 472 Frédéric Bozo, 'Before the Wall: French Diplomacy and the Last Decade of the Cold War, 1979–89', in Olav Njølstad, ed., *The Last Decade of the Cold War: From Conflict Escalation to Conflict Transformation* (London, 2004), 88–316.

[61] Thomas E. Halverson, *The Last Great Nuclear Debate: NATO and Short-range Nuclear Weapons in the 1980s* (Basingstoke, 1995); speech by Lushev at Warsaw Pact summit, 7 July 1989, http://www.php. isn.ethz.ch/collections/colltopic.cfm?lng=en&id=19023&navinfo=14465. 'Verteidigungspolitische Richtlinien.' April 1988, obtained by East German intelligence, Bundesarchiv-Militärchiv, Freiburg, Germany [hereafter BA-MA], AZN 32651.

on themselves, they presented a variety of proposals for zones of reduced armaments and disengagement. East Germany's Erich Honecker, overconfident in his country's resilience, took the lead by hosting in East Berlin the International Meeting for Nuclear Weapons-Free Zones, with participants from 113 countries. Hailing the INF treaty, he intoned that 'for the first time, the start of nuclear disarmament has been accomplished, and the vicious circle of pre- and counter-armament has been broken after decades of confrontation and distrust'. He joined with his Czechoslovak counterparts in celebrating the withdrawal of Soviet missiles from their territories.[62]

Supportive of the proposals, in 1987 Gorbachev assured the Warsaw Pact allies that 'we have seized the initiative' to prevent the enemy from 'wearing down socialism' through the arms race. It was from a perceived position of strength rather than of weakness that he announced, in his speech to the UN in November 1988, deep unilateral cuts of Soviet conventional forces. Afterward, he confided to the party Politburo his belief that having 'pulled the rug [out] from under the feet of' sceptics, he filled US hardliners with 'concern, anxiety, and even fear'.[63]

Gorbachev's sensational announcement did not immediately affect the asymmetrical military balance on the central front of the still divided continent. In May 1989, NATO merely postponed the planned modernization of its short-range missiles in response to widespread opposition to the plan, especially in West Germany. The negotiations restarted in Vienna after the MBFR talks had been transformed under CSCE auspices into separate CFE talks about conventional forces in Europe and CSBM talks about confidence-building measures, which finally used accurate figures about the asymmetries. But the prevailing opinion was that sorting out all the complexities, not to mention reaching an agreement, would take a long time, if it could be accomplished at all.[64]

In the event, forces beyond the military balance decided otherwise. The accidental breach of the Berlin Wall in November 1989 and Moscow's acquiescence in the resulting collapse of communism in Eastern Europe destroyed the Soviet Union's 'strategic shield' in the region. In the sequence of events that ended the division of Europe—and with it the Cold War—where it had started, military power, not to mention nuclear weaponry, was notable for its irrelevance. Once Europe's precarious balance resting on the oversized military forces facing each other on the divided continent was no more, Gorbachev and his Western counterparts had to deal with the consequences. Before they did, however, East Europeans

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[62] Speech by Honecker, 20 June 1988, *East Europe: Berlin Nuclear-Weapons-Free-Zones Meeting*, Foreign Broadcast Information Service, 29 June 1988, 2.
[63] Gorbachev at meeting of party secretaries, 11 December 1987, DC/20/I/3/2581, 67, SAPMO, Bundesarchiv, Berlin, Germany; Gorbachev at meeting of defence ministers, 7 July 1988, http://www.php.isn.ethz.ch/collections/colltopic.cfm?lng=en&id=20982&navinfo=14565; Minutes of Soviet Party Politburo, 27–28 December 1988, *Cold War International History Project Bulletin* 12–13 (2001), 24–9.
[64] 'Trends and Developments in Warsaw Pact Theater Forces and Doctrine Through the 1990s', February 1989, Benjamin B. Fischer, ed., *At Cold War's End: US Intelligence on the Soviet Union and Eastern Europe, 1989–1991* (Washington D.C., 1999), 265–87; Catherine McArdle Kelleher, Jane O. Sharp, and Lawrence Freedman, eds., *The Treaty on Conventional Armed Forces in Europe: The Politics of Post-Cold War Arms Control* (Baden-Baden, 1996).

had already started creating *faits accomplis*, which materially affected the building of new security architecture.

The new government of Czechoslovakia, followed by that of Hungary, lost no time negotiating the withdrawal of Soviet troops from the two countries, and in less than a year they were all gone. The Polish government, hedging against the rise of unifying Germany, unnecessarily delayed their departure, but eventually got rid of them, too. West German chancellor Helmut Kohl masterminded the unification by manipulating the four powers whose approval was needed, bribing the impecunious Soviet Union to evacuate its half a million troops from the eastern part of the country in return for economic aid.[65]

Attesting to the waning influence of the superpowers, the 'endgame was heavily European'. The reconstruction of Europe's broken military balance was not negotiated between them but between NATO and the disintegrating Warsaw Pact. Once a radical reduction of their forces suddenly appeared not only attainable but also imminent, the alliances provided the framework for the conclusion in 1990 of both the CFE treaty and an agreement on confidence building measures. For the first time in history, the size and deployment of military forces in Europe were to be regulated by a legal covenant rather than being left to the discretion of its sovereign governments. With the advent in 1992 of the European Union, which coincided with the demise of the Soviet Union, the Continent began to face the problem of scarcity rather than excess of military power on its soil.[66]

The nuclear arms race ended, but has had an afterlife. Before the Soviet Union expired, the START treaty had set limits to the future American and Russian arsenals, and by the end of the century about 80 per cent of their strategic nuclear weapons had been dismantled. In the fall of 1990, President George H. W. Bush had also announced the elimination of all the tactical ones deployed by the United States overseas, and a week later Gorbachev reciprocated by withdrawing all but 500 of them, which Russia has since kept on its own territory. NATO's Nuclear Planning Group, however, found it appropriate to reaffirm the indispensability of nuclear weapons for NATO's strategy.

Fifteen years later, 480 US nuclear bombs—all of the obsolete gravity kind—remained on the territory of six NATO states, in addition to those owned by Britain and France. By 2012, about 1,000 of them, including some 200 American, were still there. And as recently as December of that year, the Pentagon defied looming budget cuts by announcing its intention to spend $20 billion—for their modernization rather than elimination.[67]

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[65] *The Great Withdrawal: Withdrawal of the Soviet-Russian Army from Central Europe, 1990–1994* (Bratislava, 2005); Mary Elise Sarotte, 'Perpetuating US Preeminence: The 1990 Deals to "Bribe the Soviets out" and Move NATO in', *International Security* 35/1 (2010), 110–37; Lothar Ruehl, 'NATO and the German Question', in Gustav Schmidt, ed., *A History of NATO: The First Fifty Years* 3 vols. (Basingstoke, 2001), ii, pp. 131–53.

[66] Mary Elise Sarotte, *1989: The Struggle to Create Post-Central Europe* (Princeton NJ, 2009), 209; Richard A. Falkenrath, *The Origins and Consequences of the CFE Treaty* (Cambridge MA, 1995), 241–53.

[67] Joshua Handler, 'The 1991–1992 PNIs and the Elimination, Storage and Security of Tactical Nuclear Weapons', in Brian Alexander and Alistair Millar, eds., *Tactical Nuclear Weapons: Emergent Threats in an Evolving Security Environment* (Washington D.C., 2003); Hans M. Kristensen, *U.S. Nuclear*

CONCLUSION

The United States and Soviet Union were not alone in running the Cold War arms race. Their respective allies, dependents, and clients increasingly influenced it, for better or for worse—the American ones more than their Warsaw Pact counterparts, some of these trying harder than contemporaries suspected. Besides the superpowers, other powers were driving nuclear proliferation, notably such strange bedfellows as de Gaulle's France and Mao's China. 'Unarmed forces'[68] of Western European peace activists unwittingly helped the Soviet Union reverse the armed competition by influencing the mind of the man who had the power to do so. All this shows how much the nuclear dimension of the competition became divorced from real life, particularly political life. If the lesser actors played only secondary roles as long the arms race lasted, once it ended Europeans in both East and West figured prominently in sorting out the consequences.

We now know what contemporaries did not know, namely, that the principals never wanted to go to war with each other and hoped dearly to avoid it. Despite all the speculation about the importance of deterrence in ensuring 'the long peace',[69] there was no such proclivity for preventive war as that which had motivated leaders who had plunged Europe into the First World War. Most people in Western Europe, other than the anti-nuclear activists, were willing to tolerate the arms race not only to save money on conventional forces but also because they believed the men in power, in both Washington and Moscow, were sensible enough not to let things get out of hand. Although this was true, things could nevertheless have gone terribly wrong accidentally because of the sheer quantity of the accumulated weaponry, ready to be fired at an ever-shorter notice. Moreover, there were such loose cannon as Kim Il Sung, who had no qualms about provoking a war and inciting an arms race, or Fidel Castro, ready to wield the Bomb for what he saw as the noble cause of revolution.

A theory that explains the Cold War arms race is yet to be found. If the way the competition started lends support to the concept of security dilemma, the subsequent workings of the forces beyond the superpowers defied it. The presumption that ultimate security could be found in every state going nuclear, given academic respectability by neorealist Kenneth N. Waltz, had been punctured by the reversal of horizontal proliferation even before his seminal book was published in 1979.[70]

Weapons in Europe: A Review of Post-Cold War Policy, Force Levels, and War Planning (Washington D.C., 2005); Eben Harrell, 'What to Do About Europe's Secret Nukes', *Time*, 4 January 2010; Julian Borger, 'New Push to Remove Tactical Nuclear Weapons from Europe', 3 February 2012, http://www.guardian.co.uk/world/julian-borger-global-security-blog/2012/feb/03/nuclear-weapons-tactical. 'Pentagon Modernizing Nuclear Weapons in Europe', 6 December 2012, http://www.thetrumpet.com/article/10149.18.0.0/world/military/pentagon-modernizing-nuclear-weapons-in-europe.

[68] The title of Matthew Evangelista, *Unarmed Forces: The Transnational Movement to End the Cold War* (Ithaca NY, 1999).

[69] The title of John Lewis Gaddis, *The Long Peace: Inquiries into the History of the Cold War* (Oxford, 1987).

[70] Kenneth N. Waltz, *Theory of International Politics* (Reading PA, 1979). The author later resurrected the theory to offer a recipe for dealing with Iran's nuclear ambitions in his 'Why Iran Should Get the Bomb: Nuclear Balancing Would Mean Stability', *Foreign Affairs* 91 (2012), 2–5.

And ten years later, the reversal of vertical proliferation in defiance of realist orthodoxy enhanced rather than diminished security—except for the two South Asian rivals whose strategic establishments remained strongholds of the theory. Neither did the manner in which the reversal was accomplished and formalized in the INF and CFE treaties occur simply because of a leap of trust or follow the step-by-step GRIT pattern. In the outcome, the role of contingency and the personalities of the politicians concerned mattered even more than usual in such developments.

Any generalizations that could be drawn from the Cold War arms race are limited by its anomalous character. Not only were its nuclear dimension and its potentially catastrophic consequences unprecedented, but also another confluence of circumstances even remotely similar to that which set the race in motion is all but impossible to imagine. Coming to grips with its legacy thus means above all resisting the temptation to draw false analogies that could only make the very different problems of today's world more difficult to deal with.

PART IV

EXTRA-EUROPEAN ARMS RACES AND DEVELOPMENTS SINCE THE COLD WAR

Introduction

Thomas Mahnken

Although the concept of an arms race achieved the greatest prominence as a way of understanding US–Soviet dynamics during the Cold War, it has broader applicability beyond the central competition between the United States, Soviet Union, and their allies. As the first two chapters in this section attest, the concept of an arms race provides a useful lens through which one can view regional arms dynamics. Avi Kober's chapter explores the role of arms races in the Arab–Israeli conflict, while Rudra Chaudhuri's chapter examines military assistance and competition in South Asia between 1953 and 1965. Both cases were linked to the Cold War via superpower alliances with regional actors, and by virtue of the fact that the superpowers were major arms suppliers to states in the Middle East and South Asia. Together the cases highlight both the utility of models developed with primary reference to great powers, but also their limited applicability to explaining regional arms dynamics.

As the final two chapters of this volume attest, the concept of an arms race has found new salience in recent years. First, the growth of defence spending and rapid military modernization among Asian states has led some scholars to begin to write about an emerging arms race in Asia (see Figures IV.1 and IV.2). Desmond Ball, for instance, has described what he sees as 'substantial evidence of action-reaction dynamics, of an emerging complex arms race in Northeast Asia'.[1]

Second, some scholars have focused more narrowly on arms dynamics in the maritime domain. Geoffrey Till, for example, has argued that patterns of naval modernization in the Asia–Pacific region bear the hallmarks of an arms race in the

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[1] See Desmond Ball, 'Asia's Naval Arms Race: Myth or Reality?' paper delivered at the 25th Asia–Pacific Roundtable, Shangri-la Hotel, Kuala Lumpur, Malaysia, 30 May 2011.
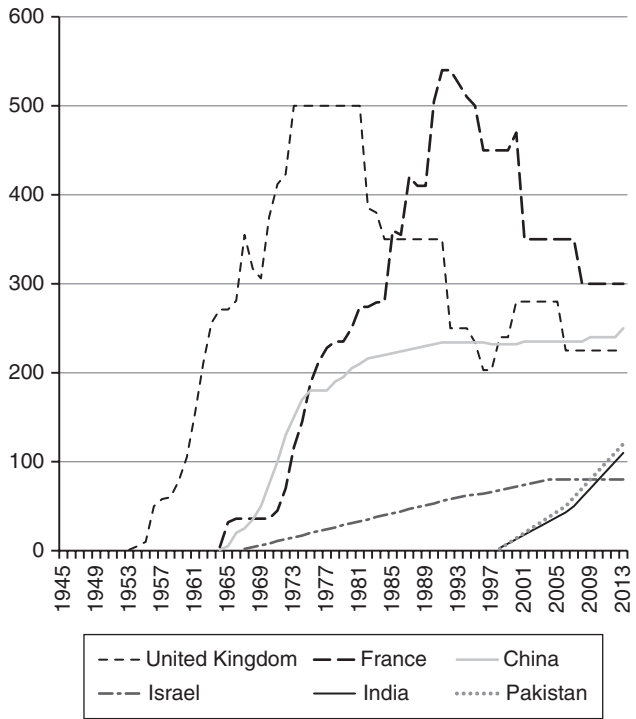
Figure IV.1. British, French, Chinese, Israeli, Indian, and Pakistani Nuclear Weapons Stockpiles, 1945–2013
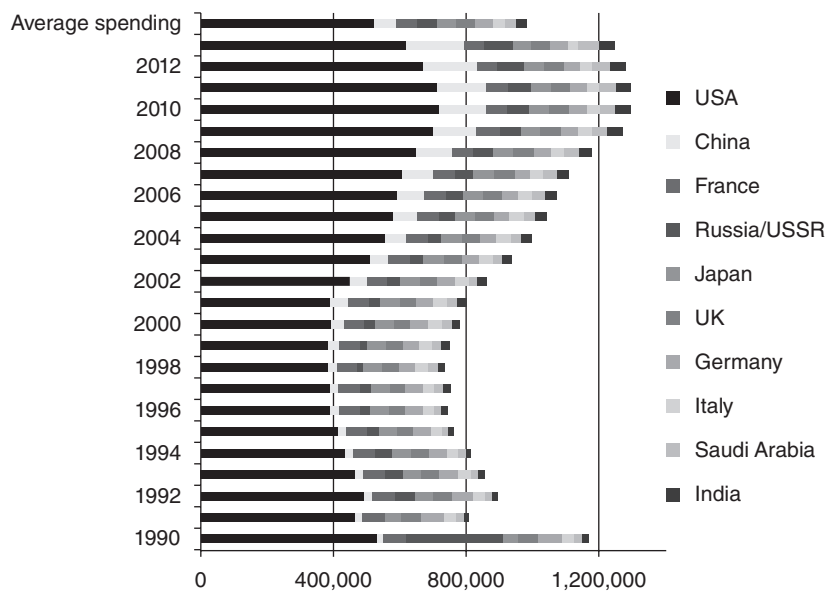
Figure IV.2. Post-Cold War Military Expenditure

making.[2] Christian Le Mière, for his part, has argued that the acquisition of submarines by a growing number of Asian states presages greater competition.[3]

Third, some scholars have focused on Chinese military modernization and the increasingly competitive dynamics between the United States and China.[4] Tai Ming Cheung's chapter explores China's arms modernization and the dynamics of strategic competition in Asia.

Finally, some have examined the broader diffusion of precision-strike weaponry and its application both to enhance power projection and to frustrate it through the development and deployment of so-called anti-access/area-denial capabilities.[5] Christian Le Mière, for example, has explored the spread of anti-access capabilities and questioned whether the Cold War logic of a security dilemma applies to such defensive capabilities.[6] Thomas Mahnken's chapter explores the development and diffusion of precision-strike weaponry, arguing that we are witnessing an unfolding competition between the ability to project power, on the one hand, and ability to deny access, on the other. Although characterized by strategic interaction, it is not a closely coupled arms race of the sort postulated by Cold War theorists. Interaction among the key actors has been episodic and multipolar, and domestic considerations have played a prominent role. A more traditional arms race could emerge in the future, of course, but its emergence is hardly preordained.

[2] Geoffrey Till, *Asia's Naval Expansion: An Arms Race in the Making?* (London, 2012).

[3] Christian Le Mière, 'Asia's Competition Beneath the Waves Intensifies', The Military Balance Blog, 31 January 2014, available at http://www.iiss.org/en/militarybalanceblog/blogsections/2014–3bea/january-1138/asia-competition-3010.

[4] Thomas G. Mahnken, 'Arms Races and Long-Term Competition' in Thomas G. Mahnken and Dan Blumenthal, eds., *Strategy in Asia: The Past, Present, and Future of Regional Security* (Stanford CA, 2014).

[5] *See*, for example, Barry D. Watts, *The Maturing Revolution in Military Affairs* (Washington, D.C.: Center for Strategic and Budgetary Assessments, 2011).

[6] Christian Le Mière, 'The Spectre of an Asian Arms Race', *Survival* 561 (2014), 139–56.

Map 4. The Middle East

9

Arms Races and the Arab–Israeli Conflict

Avi Kober

The purpose of this chapter is to illustrate the dynamic nature of the Arab–Israeli arms race, to identify the external and internal factors that have affected it, to discuss the role played by technology in this arms race, to point to the linkage between conventional and unconventional arms races in the Middle East, and to assess the connection between arms racing and the outbreak of Arab–Israeli wars.

THE DYNAMIC NATURE OF THE ARAB–ISRAELI ARMS RACE

Like war itself, arms races often change their character. And indeed, the Arab–Israeli arms race has undergone several changes over the years, which have reflected changes in the environment of the Arab–Israeli conflict: a shift from high-intensity conflict (HIC)-based arms races to low-intensity conflict (LIC)-based races; from a bipolar Arab–Israeli arms race to a regional arms race; from a conventional to an unconventional arms race; and from an arms race that reflected the global arms race to one more detached from global developments.

A Shift from an HIC-Oriented Arms Race to an LIC-Oriented One

Until the 1970s, the Arab–Israeli arms race had reflected the reality of high-intensity conflict. Since the 1980s, low-intensity conflicts have become the most pervasive type of war in the international system in general and the Middle East in particular. In the Arab–Israeli LICs (which are now sometimes referred to as hybrid wars[1]) of the opening decade of the twenty-first century the weaker, non-state side has been acquiring capabilities that in the past would have been found in the hands of regular armies. By obtaining simple and relatively cheap weapons, such as short-, medium-, and long-range rockets and missiles, non-state players have been able to target Israel's civilian rear and demoralize its citizens. For example, in late-2013 Hezbollah possessed an arsenal of over 80,000 missiles and rockets of all calibres. It has also tried to acquire state-of-the art surface-to-air batteries and surface-to-sea

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[1] Frank G. H. Hoffman, *Conflict in the Twenty-First Century: The Rise of Hybrid Wars* (Arlington VA, 2007).

systems, and has been developing drones.[2] The dramatic improvement of the non-state players' weapons arsenal has increased their self-confidence to the point where they have dared to provoke the strong even at the risk of war, as has happened in recent decades with the PLO, Hezbollah, and Hamas.

This development has been followed by a military build-up on the Israeli side, tailor-made to respond to LIC challenges. Both sides have found themselves in an arms race, in which Israel's military-technological edge has been eroded. Yet, this has not changed the basic fact that the stronger side has still been capable of defeating the weaker side should it only decide to do so. The IDF's response has been based on a combination of ground manoeuvre, air attack, excellent intelligence, precision fire, and network-centric technology, which allows inter-arm strikes and enhanced command-and-control capabilities. All of these elements have been supposed to enable greater efficiency in destroying the missile- and rocket-capabilities of Hezbollah and Hamas and in delivering a painful blow to these organizations' infrastructure.[3] LICs have also required that the IDF maintain a significant and effective ground forces capability and avoid its degeneration.

A Shift from a Bipolar, Arab–Israeli Arms Race to a Regional Arms Race

Since the end of the Cold War, with the growing importance of regional arms races, the Arab–Israeli arms race has no longer been the major arms race in the region. Iranian military power has been on the rise, and the so-called 'Arab Spring' and the toppling of the Mubarak Regime in Egypt have weakened the Sunni camp, causing great concern in Saudi Arabia and the Gulf states. As a result of this concern, Saudi Arabia tried to achieve a political unification of the Gulf states under its leadership, with the aim of balancing Iran. The good news for the Sunnis has come from Turkey, which has seemed to be on its way to becoming an active regional power. There has no longer been an effective anti-Israel war coalition or alliance; Israel has enjoyed a tacit cooperation with regional pro-Western Sunni players, such as the Gulf states, that wished to see Iranian power restrained.

Conventional vs. Unconventional Arms Race

Israel's decision to go nuclear came out of pessimism regarding its ability to sustain a conventional arms race with its Arab enemies over the long run. It has been able to maintain its nuclear monopoly against the Arab states, although the latter have balanced this monopoly to some extent by acquiring chemical and biological weapons. Thanks to its doctrine of nuclear opacity, Israel has so far managed to postpone the nuclearization of the entire region for some five decades. But should

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[2] *Haaretz*, 23 May 2012, http://www.haaretz.com/news/diplomacy-defense/idf-israel-in-range-of-nearly-65–000-hezbollah-iran-syria-rockets.premium-1.432012; Yaakov Lappin, 'Israel vs. the Iran-Hizballah Axis', *BESA Center Perspectives Paper* 221 (2013), http://besacenter.org/perspectives-papers/israel-vs-iran-hizballah-axis/.

[3] Lappin, 'Israel vs. the Iran-Hizballah Axis'.

Israel shift from its doctrine of nuclear opacity to a declared nuclear capability, or should nuclear proliferation take place regardless of any change in Israeli doctrine, the entire region and Arab–Israeli relations would enter a new era of nuclearization and a nuclear arms race.[4]

The Linkage Between Global and Local Arms Races

During the Cold War, three sets of relationships were relevant to the Arab–Israeli conflict: horizontal Arab–Israeli relations; horizontal inter-superpower relations; and vertical relations between the great powers and their local clients. When the global rivalry was especially intense, great-power arms races spilled over to peripheral regions such as the Middle East, and patron-client relationships were established between the great powers and local states. The US and the USSR provided arms to their clients, thereby deepening the latter's dependence on their patrons. For the US, Israel also constituted an anti-Soviet bulwark in the Middle East, which reduced the military and political influence of the Soviets by destroying Soviet-supplied military capabilities. The US and the USSR, however, were not the only arms suppliers to the parties in the Arab–Israeli conflict: at various times Britain, France, West Germany, and China supplied considerable amounts of arms to Israel and to Arab states.[5]

In the post-Cold War era, the US became the only superpower in the international system and the dominant one in the Middle East. In the years 2001–4, most of the arms deals in the Middle East were conducted with the US.[6] This new reality, alongside the need to stop the Iranian build-up, which has constituted a threat to America's bases and allies in the region, has accounted for a dramatic increase in the Gulf states–Iran arms race. At the same time, however, the US was in a better position to constrain the Arab capability to go to war with Israel, which had a mitigating effect on the Arab–Israeli arms race.

EXTERNAL AND INTERNAL FACTORS

Researchers have been divided on the explanations for arms races. Are arms races a product of the dynamics of the international system, or rather a product of a domestic pathology? In his classic work, Lewis Richardson offered a systemic explanation, pointing to the threat-based action-reaction process that might lead to an endless arms race and make war more likely, although this is not an irreversible deterministic course, as the action-reaction process can be curbed by factors such as

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[4] Avner Cohen, *Israel and the Bomb* (New York, 1998); Shlomo Aronson, *The Politics and Strategy of Nuclear Weapons in the Middle East* (New York, 1992); Yair Evron, *Israel's Nuclear Dilemma* (Ithaca NY, 1994).

[5] J.S. Milstein, 'Soviet and American Influences on the Arab–Israeli Arms Race: A Quantitative Analysis', Paper delivered at the Conference on the Middle East Conflict of the Peace Research Society (International), Massachusetts, 4–5 June 1970. http://www.dtic.mil/dtic/tr/fulltext/u2/734682.pdf.

[6] Yoel Guzansky, *Medinot Hamifratz Bisviva Estrategit Mishtana* [The Gulf States in a Changing Strategic Environment] (Tel-Aviv, 2012), 84.

resources constraints.[7] Neo-realists, too, have suggested a systemic explanation that attributes military build-up and aggression to the anarchic nature of the international system. Offensive and defensive (neo) realists, however, have differed on how it would be best to achieve security—by arming to the point of being stronger than the enemy, as preached by offensive realists such as John Mearsheimer or Fareed Zakaria,[8] or by aiming at even-handedness in arms, with an emphasis put on a defensive posture so as to curb and control the 'security dilemma' dynamic, as advocated by defensive realists, such as Charles Glaser or Jack Snyder.[9] The concept of a security dilemma refers to a situation in which a player arms or joins an alliance in order to strengthen its security, but this may lead other players to feel insecure and respond with similar measures, to the point of creating mutual hostility or conflict that no one desired.[10] Neo-classical realists, like Randall Schweller, have pointed to the contribution of unit-level, domestic pathology to military build-up and violence, drawing a distinction between status quo and revisionist players.[11]

According to Charles Glaser, revisionism is likely to generate a *deterrence-driven* arms race, wherein the challenged adversary tries to prevent the challenger from changing the status quo. While most realists would consider the security dilemma a systemic factor, Glaser rather considers it an internal factor. Either way, the security dilemma can generate an arms-race 'spiral', a dynamic that defensive realists are committed to avoid.

External, Systemic Factors and the Spiral Model of Arms Races

As a regional arms race, the Arab–Israeli arms race has been fed by three main external factors: first, arms sales by great powers;[12] second, regional rivalries; third, a security dilemma dynamic.

Arms Sales by Great Powers

In 1948 Britain considered itself the patron of Egypt, Jordan, and Iraq, whereas the USSR acted as Israel's patron. Both before the establishment of the state of Israel

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[7] L. F. Richardson, *Arms and Insecurity* (Pittsburgh PA, 1960); Barry Buzan and Eric Herring, *The Arms Dynamic in World Politics* (London, 1998), 83.

[8] John J. Mearsheimer, *The Tragedy of Great Power Politics* (New York, 2001); Fareed Zakaria, *From Wealth to Power: The Unusual Origins of America's World Role* (Princeton NJ, 1998).

[9] Charles L. Glaser, 'The Causes and Consequences of Arms Races', *Annual Review of Political Science* 3 (2000), 251–76; Jack Snyder, *Myths of Empire: Domestic Politics and International Ambition* (Ithaca NY, 1991).

[10] On the concept of the security dilemma, see, for example, Robert Jervis, 'Cooperation under the Security Dilemma', *World Politics* 30 (1978), 167–74; Robert Jervis, *Perception and Misperception in International Politics* (Princeton NJ, 1978), 58–113; Paul Roe, 'The Intrastate Security Dilemma: Ethnic Conflict as a Tragedy?' *Journal of Peace Research* 36/2 (1999), 183–202; John H. Herz, 'Idealist Internationalism and the Security Dilemma', *World Politics* 2/2 (1950), 171–201.

[11] Randall Schweller, 'Bandwagoning for Profit: Bringing the Revisionist State Back in', *International Security*, 19/1 (1994), 72–107; Randall Schweller, 'Neorealism's Status-Quo Bias: What Security Dilemma?' *Security Studies* 5/3 (1996), 90–121.

[12] Keith Krause, 'Middle Eastern States in the Global Military Order', *YCISS Working Papers* (1999).

and in the aftermath of the 1948–9 war, Britain supplied weapons to the two contemporary local powers, Egypt and Jordan, and British officers served in the Jordanian Legion. On 29 May 1948, the United Nations Security Council imposed an embargo on arms sales to the Middle East. The British, who were among the initiators of this resolution, abided by it and stopped delivering arms to Egypt and Jordan, probably in the belief that the newly established state would collapse within a few weeks of the Arab invasion. The Soviets, on the other hand, hoped that the military successes of the Jewish state would accelerate British disengagement from the region. Cognizant of the Arabs' sympathetic attitudes towards Nazi Germany and their close relations with Britain, as well as the anti-imperialistic struggle of the Jewish community in Palestine, the Soviets decided to provide Israel with generous military assistance. In order not openly to violate the UN resolution they did so by proxy—via Czechoslovakia and other eastern European satellites. Thousands of rifles and machine guns, twenty-five Messerschmitt fighters, and fifty Spitfire fighters were transported from Czechoslovakia in planes that had been purchased illegally in the US by American Jews.[13] True, the Czech arms supplies had begun under the pro-Israeli government in Prague before the February 1948 coup, but they intensified under the new communist regime.[14] At the same time, the Soviets supported Israel diplomatically in the UN, justifying its conquests in the Galilee beyond the Partition Plan borders and encouraging it to get hold of the edge of the Gulf of Eilat.[15]

A few years later, however, the Soviets changed sides and started arming Egypt, again via Czechoslovakia. In September 1955 Egypt signed the Czech–Egyptian arms deal, which included advanced weapon systems such as 330 T-34 tanks, 200 BTR armoured personnel carriers, 500 mortars, guns and howitzers, 170 MiG-15 and Il-28 combat aircraft, a number of submarines, two destroyers, and twelve torpedo boats.[16] This signalled the gradual opening up of the whole Soviet arsenal first to Egypt and subsequently to Syria and Iraq.[17]

The deal was perceived by Israeli political and military echelons as a potential existential threat, pushing them into an accelerated arms race with Egypt, based on French weapons systems, and later on into an anti-Egypt coalition with France and Britain. France had provided most of Israel's military equipment and weaponry

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[13] Amitzur Ilan, *Otzma Ve'hakhra'a Tzava'it Bemilkhemet Tashakh* [Embargo, Power, and Military Decision in the 1948 Palestine War] (Tel Aviv, 1995), 184–94; Doron Almog, *Harekhesh Be'artzot Habrit 1945–1949* [Weapons Acquisition in the United States 1945–1949] (Tel Aviv, 1987); Yehoshua Ben-Arye, ed., *Ha'historia shel Eretz* Israel [History of the Land of Israel] (Jerusalem, 1983), 214–16; Zeev Schiff and Eitan Haber, *Israel, Tzava Ve'haganah* [Israel, Army, and Defence] (Tel Aviv, 1976), 256.

[14] Uri Bialer, 'The Czech-Israeli Arms Deal Revisited', *Journal of Strategic Studies* 8/1 (1985), 307–15.

[15] For the Soviet position see: Walter Laqueur, *The Soviet Union and the Middle East* (London, 1959), 146–50; Yaacov Ro'i, *From Encroachment to Involvement: A Documentary Study of Soviet Policy in the Middle East 1945–1973* (New York, 1974), 51–66; Lieutenant-Colonel A. 'The War of Independence in the Eyes of the USSR', *Maarachot* 294–5 (1984), 69–73.

[16] Edward N. Luttwak and Dan Horowitz, *The Israeli Army* (London, 1975), 141.

[17] Motti Golani, 'The Historical Place of the Czech-Egyptian Arms Deal, Fall 1955', *Middle Eastern Studies* 31/4 (1995), 803–27; Rami Ginat, 'Origins of the Czech-Egyptian Arms Deal: A Reappraisal', in David Tal, ed., *The 1956 War* (London, 2001),145–68.

prior to the 1956 war. In 1955 it agreed to sell Israel dozens of AMX and Sherman tanks, aircraft (several MD 450 Ouragan fighter-bombers, Vautours, dozens of Mystère 2 and Mystère 4A), 200 armoured vehicles, guns, and combat trucks.[18]

The 1960s saw an accelerating arms race between Israel and Egypt. A contributing factor was the availability of weapons from the Soviet Union for the Egyptians and from France for the Israelis.[19] Israel purchased Super Mystère fighters, Vautour II bombers, and Mirage III fighters.[20] Later in the 1960s, the US replaced France as Israel's patron and arms supplier. Following the shipment of the Soviet Tu-16 to Egypt, the US sold Israel Skyhawk aircraft, Phantom fighters, heavy assault helicopters, utility helicopters, Hercules transports, Patton tanks, and new artillery weapons.[21]

Whereas Israel continued to lean on Western weapons sources, Syria and Egypt continued to rely on the USSR. The number of Egyptian battle tanks increased from 700 in 1960 to 1,200 in 1967, and the number of jet fighters increased from 165 to 350. Egypt also bought thirty strategic bombers, and modern Tu-16s.[22] Shortly after the Arab defeat in the 1967 Six-Day War, the Soviets provided Egypt with more than 200 new aircraft, which included Su-7 ground attack aircraft, MiG-21 aircraft, and T-54 and T-55 tanks.[23] When the Soviets shifted from involvement to intervention during the Egyptian–Israeli 1969/70 War of Attrition by manning and operating SA-3 surface-to-air missiles (to which the Israeli Air Force had no answer), as well as MiG-21Js, the competition between the Soviets and Israelis became direct. In this competition the Israelis eventually lost.[24] This was the first time the Soviets directly intervened, the next being the 1973 October War.

In 1973 the Soviets delivered a huge quantity of weapons and ammunition to their Egyptian and Syrian allies, while the US withheld arms shipment to Israel until 13 October.[25] At critical stages in the war, Israel and the USSR deterred each other with nuclear weapons, which meant that the Soviets balanced Israel's nuclear edge by extending a nuclear umbrella over their local clients.[26] On the southern front, the higher the probability of Egyptian defeat, the more prone the Soviets became to intervene. To this effect they put their strategic air force on alert and deployed two Soviet-manned Scud missile units armed with nuclear warheads on Egyptian soil. Israel reacted by deploying Jericho surface-to-surface missiles, leaving the nature of their warheads for the Soviets to decide.[27]

Following the post-war Egyptian–Israeli peace agreement and the new pro-American orientation of Egypt, the Arab–Israeli arms race was no longer intensified

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[18] Schiff and Haber, *Tzava Ve'haganah*, 488.   [19] *Ibid.*, 170.   [20] *Ibid.*

[21] *Ibid.*, 330–1.

[22] *Foreign Relations of the United States*, 1964–1968, Volume XVIII, Arab–Israeli Dispute, 1964–67, Doc. 319 http://history.state.gov/historicaldocuments/frus1964–68v18/d319.

[23] Luttwak and Horowitz, *The Israeli Army*, 300.

[24] *Ibid.*, 323–5; Dmitry Adamsky, Mivtza Kavkaz [Operation Caucasus] (Tel Aviv, 2006).

[25] Avi Kober, 'Great-Power Involvement and Israeli Battlefield Success in the Arab–Israeli Wars, 1948–1982', *Journal of Cold War Studies* 8/1 (2006), 20–48.

[26] See, for example, I. Ginor, 'The Red Army at Sadat's Service', *Yediot Aharonot* 5 October 2003.

[27] Professor Yuval Neeman, cited in Amir Oren, 'The Atomic Red Line', *Haaretz* 23 May 1997. Neeman belonged to the inner circle advisers who participated in discussions at the highest governmental and military levels during the war.

by superpower competition during the remainder of the Cold War, although Syria, for example, continued to arm with Russian weapons systems.

As already pointed out, since the end of the Cold War the US has been the only superpower in the international system and the dominant power in the Middle East. In the years 2001–4, 56.1 per cent of the arms deals in the Middle East were transacted with the US, as compared to 18.7 per cent with Britain and 15.4 per cent with Russia.[28]

Regional Rivalries

The Arab military build-up, which had traditionally been accelerated by inter-Arab rivalries between Egypt, Saudi Arabia, Iraq, Syria, and Jordan, and by tensions between Arab and non-Arab countries in the region, like Turkey and Iran,[29] has in the 2000s taken on a new form. Two non-Arab 'Pans' have become active: Pan-Turkism and Pan-Iranism. Pan-Turkism is a nationalist movement that emerged in the 1880s among Turkic intellectuals who opted for cultural and political unification of all Turkic peoples. Likewise, Pan-Iranism is an ideology that advocates solidarity and reunification of peoples with Iranian cultural affiliation. Against the backdrop of declining American influence in the region in recent years, the historic competition between Turkey and Iran over regional leadership has intensified.[30] Although these two regional players have tried not to act as if they were rivals or to engage in an arms race, the potential for a clash between them remains.

The weakening of Iraq as a result of the American invasion and the toppling of Saddam Hussein's regime, on the one hand, and on the other the Iranian nuclearization process that has been accompanied by threats directed against Israel, have put Israel in the position of the regional balancer vis-à-vis Iran. While neither Israel nor Iran has been interested in attacking the other, both have felt threatened. Iran has been afraid of an Israeli and/or Western coalition attack in order to stop its nuclearization. Given its relatively weak military and its lack of a common border with Israel, Iran has been developing missiles of various ranges that could carry both conventional and unconventional warheads, reaching Israel and more distant targets. Israel, in turn, has continued to rely on the capabilities it had long been developing. As far as nuclear capability is concerned, Israel has built a triad, which consists of surface-to-surface missiles, a strategic air force, and submarines equipped with cruise missiles, which are supposed to serve as a second-strike capability.

The Security Dilemma

In the light of the existential threat posed to Israel by the regular armies of the Arab states during the 1948 War, and Israel's attempt to balance the extensive Arab military build-up during the 1950s, a typical spiral-model arms race developed, which

[28] Guzansky, *Medinot Hamifratz Bisviva Estrategit Mishtana*, 84.
[29] Anver Yaniv, *Politika Ve'estrategia Be'Israel* [Politics and Strategy in Israel] (Tel Aviv, 1994), 142.
[30] Can Kasapoglu, 'The Cold War between Turkey and Iran', *BESA Center Perspectives* Papers 172 (2012).

emanated from Israel's strong sense of insecurity. Egypt's military build-up was also driven by a sense of weakness, contributing to the spiral effect, and accounting for an Israeli counter-build-up (defence expenditure rising from 1952), based on French weaponry. Particularly threatening was the September 1955 Czech–Egyptian arms deal, which Israel perceived as reflecting offensive intentions against it. Israel was considered by Egypt most threatening after its reprisal operation in the Gaza Strip in late February 1955, code-named 'Black Arrow', during which the Israeli Defence Force attacked Egyptian—rather than Palestinian—targets in order to force Egypt to stop *fedayeen* activities against it from the Egypt-dominated Gaza Strip. Researchers have been divided on the question of whether the operation triggered the Czech–Egyptian arms deal. Some have believed that it did, while others have argued that the Czech–Egyptian arms deal had been agreed upon before Black Arrow, and therefore could not be held accountable for Egypt's decision to go ahead.[31] There was no doubt, however, that the arms deal would upgrade Egypt's military capabilities both quantitatively and qualitatively.[32]

In the early 1950s, France became Israel's great power patron and main arms supplier. Unlike the Americans, who used to turn down most of the items on Israeli acquisition request lists presented to them, France shared with Israel a common enemy—Egypt. Threatened by Egypt's support for the Front de Libération Nationale in Algeria, France was ready to provide Israel with new weapon systems that were unprecedented in quantity and quality. Arms shipments which arrived in Israel in late 1956 consisted of sixty Mystère-4 aircraft, six Ouragans, six Meteors, five S-55 helicopters, 120 AMX-13 light tanks, eighty American Sherman tanks, self-propelled artillery, radar systems, and small arms. A significant portion of Israeli defence expenditures was now devoted to purchasing these items.[33]

In the wake of its defeat in the 1956 Sinai War, Egypt tried not only to balance Israel's military power, but also to exceed it. In the period 1962–7 Egypt doubled its defence spending. The number of battle tanks increased from 700 in 1960 to more than 1,200 by June 1967; the number of jet fighters increased from 165 to 350, and Egypt purchased thirty Tu-16 strategic bombers. Syria's tank forces increased from 350 in 1960 to 550 in 1967, and the number of jet fighters rose from fifty to 120. The number of Jordanian troops grew during the same period

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[31] Michael B. Oren, 'Has Operation Gaza Accounted for a Change in Egypt's Policy?' in Moti Golani, ed., *Hetz Shachor: Gaza Raid and the Israeli Policy of Retaliation during the Fiftie*s (Tel Aviv, 1994), 41–2.

[32] 275 tanks in addition to the 370 it already possessed—some of them medium-level British-built Centurions and others relatively old. At the beginning of 1956 the IDF's assessment was that within about a year and a half the Egyptians would be able to activate three armoured brigade formations based on the Russian T-34 tank, which was then new in the Middle East arena, while keeping a battalion of Centurions in reserve. There was also talk of two battalions of Sherman tanks as support for infantry divisions, and of an unknown number of armoured reconnaissance patrols utilizing the French AMX13 tank. In the air: although Israel had a small advantage over Egypt in jet fighters at the end of 1955, the forecast was for limited procurement in the face of the impressive quality and quantity that the Czech deal was introducing into the region: the MiG-15 and perhaps the MiG-17, a new generation of warplanes. The quantities mentioned were very significant in the terms of the period: 200 warplanes, some 70 Ilyushin-28 bombers, and more. Moti Golani, 'The Historical Place of the Czech-Egyptian Arms Deal', *Middle Eastern Studies* 31/4 (1995), 803–27.

[33] Kober, 'Great Power Involvement and Battlefield Decision', 39.

from 30,000 to 55,000, and the Jordanians tripled the number of their tanks (from 100 to 300) and doubled their air force.[34]

Israel, for its part, had to balance a potential alliance-based anti-Israel war coalition consisting of the direct confrontation states and of expeditionary forces from non-neighbouring Arab states. This resulted in a spiral-model arms race that was fed by the adversaries' patrons—the USSR on the Egyptian side and France as Israel's patron.[35] The Soviets provided Egypt with generous help. As when supplying Israel previously, they acted indirectly, working through Czechoslovakia in order to bypass the May 1950 Tripartite Declaration that was aimed at preventing the supply of arms to players engaged in the Arab–Israeli conflict.

As a result of its arms deal with France and the Sinai War, Israel's defence consumption for 1956 doubled—becoming 217 per cent higher than in 1954–5.[36] However, thanks to the relatively low economic burden of the LIC against the Palestinians, and the blitzkrieg nature of the Sinai War, Israeli defence expenditures for the remainder of the 1950s were less than ten per cent of GDP,[37] and grew only moderately during these years—for example by 2.4 per cent per year in 1958–9.[38] None the less, in 1966, on the eve of the 1967 Six-Day War, defence consumption in real terms was 3.3 times its level in 1955, prior to the outbreak of the Sinai War.[39] The reason for this was the inter-state arms race, particularly with Egypt, which overshadowed hostilities on the Syrian border over Jordan water sources and Palestinian terror and guerrilla activities.

In the years 1973–82, an Israeli military build-up took place, which stemmed from the need to be able to fight on multiple fronts independently. This was a lesson from the 1973 October War, during which Israel had to fight simultaneously on two fronts, lacking sufficient forces to concentrate ground troops on the fronts in a sequential manner. The solution Israel found was building a larger and stronger military. Between the 1973 October War and the end of June 1977, the Israeli Defence Force's tank fleet grew by more than 50 per cent, the self-propelled artillery by more than 100 per cent, armoured personnel carriers by 800 per cent, and aircraft by 30 per cent. During the same period the IDF upgraded its quality.[40]

In the 1970s, Israel started receiving large amounts of American economic assistance. The US also agreed to finance arms purchases through loans rather than cash sales. The first significant loan for military purposes (half a billion dollars) was given in 1971. American aid took a large leap upwards after Israel withdrew from the Sinai, and after the Camp David agreement with Egypt Israel became the largest annual recipient of direct economic and military assistance from the US, receiving three billion dollars each year in direct assistance, which was about one-fifth of the

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[34] Luttwak and Horowitz, *The Israeli Army*, 166–7.
[35] Yaniv, *Politika Ve'estrategia Be'Israel*, 143.
[36] Yacoov Lifshitz, *Kalkalat Bitakhon: Te'oria Klalit Ve'hamikre Ha'Isre'eli* [Defence Economics: The General Theory and the Israeli Case] (Jerusalem, 2000), 155.
[37] Ezra Sadan, 'How is Israel's Economy Affected by the Security Situation?' *Jerusalem Issue Brief* 4 (2004). http://www.jcpa.org/brief/brief004–11.htm.
[38] Lifshitz, *Kalkalat Bitakhon*, 155.
[39] *Ibid.*, 155.   [40] Yitzhak Rabin, *Pinkas Sherut* (Tel Aviv, 1979), 505.

American foreign aid budget.[41] American aid and the peace process with Egypt calmed Israeli security concerns, and helped to slow down the Arab–Israeli arms race. Thus, in the wake of the 1975 Israeli-Egyptian interim agreement Israeli defence consumption started dropping. In 1976–7 it declined by 30 per cent, and then remained stable throughout the period 1978–82.[42] As the economy was growing at the time, the overall share of defence-related spending declined to ten per cent of GDP.[43] This happened even while on the Lebanese border Israel and the PLO waged a LIC.

   In the wake of the 1982 First Lebanon War, during which the IAF shot down eighty-six Syrian aircraft without suffering a single loss, the Syrians developed a strong sense of insecurity, as a result of which they changed their order of preference and priorities in their military build-up and started developing missile capability with the aim of threatening the Israeli rear and balancing Syria's weakness in the air. The focus on missiles was encouraged by Israel's limited interception capability against ballistic missiles at the time, the missiles' low cost compared to aircraft, and the large size of Israel's populated areas that could compensate for the lack of precision of the missiles of that time.[44] The early warning against missile attacks was very short, which created a problem for Israel that intensified with the enhanced precision of missiles. Furthermore, ballistic missiles such as the Scud B and C, or Shihab 3 enabled Arab and Moslem states not bordering Israel, such as Iran or Iraq, to threaten the Israeli civilian rear from afar. Israel's response was the development of a multilayer ballistic missiles defence, which included the Arrow missile against long-range ballistic missiles, David Sling against medium-range missiles and cruise missiles, and Iron Dome against short-range rockets.

An Internal Factor: Revisionism and the Deterrence Model of Arms Race

The first time the Arab–Israeli arms race was driven by revisionist aspirations was during the 1948 War of Independence, when an Arab war coalition attacked Israel with the intention of reversing the UN General Assembly's partition resolution. Jordan and Egypt were each interested in controlling Palestine, either by annexing it (Jordan) or by turning it into a puppet state (Egypt). The attack took place immediately after Israel had declared independence, and an accelerated military build-up on the Israeli side helped balance the Arab edge in weapon systems.

   The second time the Arab–Israeli arms race was driven by revisionist aspirations was during the post-1967 period. According to the Arab interpretation, the Arab–Israeli arms race in this period was driven by Israeli revisionism. The Arabs perceived

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[41] Joel Bainerman, 'End American Aid to Israel? Yes, It Does Harm', *The Middle East Quarterly* 2/3 (1995), 3–12. http://www.meforum.org/article/258; http://www.jewishvirtuallibrary.org/jsource/US-Israel/foreign_aid.html.
[42] Lifshitz, *Kalkalat Bitakhon*, 158–9.
[43] Sadan, 'How is Israel's Economy Affected by the Security Situation?'
[44] Reuven Pedatzur, 'Obstacles on the Road to Regional Arms Control Mechanism', *Maarachot* 369 (2000), 3–9.

the Israeli occupation of the Sinai, the West Bank, and the Golan Heights as a violation of the status quo. This, however, did not lead to rearmament to underpin deterrence but instead to Arab—particularly Egyptian—efforts to compel Israel to withdraw from these territories, which required a combination of military build-up with a strategy of attrition. The Israelis, on the other hand, believed that the revisionists were rather the Arabs, who were determined to force them to withdraw to the pre-1967 lines, which were referred to by Foreign Minister Abba Eban as 'Auschwitz lines',[45] as compared to the ceasefire lines, which Israel considered 'defensible borders' or 'security borders'. For Israelis, therefore, the Arabs, not themselves, were the revisionists who challenged the *status quo ante*, and as such they had to be deterred from renewing hostilities, a situation that created a deterrence motivation for armaments on the Israeli side.

The destruction of the Egyptian Army in 1967 and the heavy damage inflicted on the Jordanian and Syrian armies led to a sharp increase in Arab defence expenditure in order to recover militarily and to regain the lost territories at some point in the future. In late 1969, President Nasser admitted that Egypt was paying a high price for initiating the War of Attrition. During that year, the war effort reached 300 million Egyptian Liras. Nasser estimated that the economic damage inflicted in the Canal Zone reached 170 million Egyptian liras, and said that additional expenditure should be expected as a result of weapons and ammunition acquisition, loss of revenue from the Canal, and assistance to hundreds of thousands of people who had fled from their homes in the Canal area.[46]

The Soviets stood on the sidelines of the 1967 War, offering no help to Egypt and Syria. Having failed to prevent the defeat of their clients, the Soviets then sought to compensate them by providing them with more and better equipment. Whereas in 1967 the main confrontation states had 680 combat aircraft, seventy-three helicopters and 1,700 tanks, in the following six years their numbers grew significantly to 1,100 aircraft, 300 helicopters, 4,770 tanks, and 4,000 armoured personnel carriers.[47] Egypt alone received from its Soviet patron more than 200 aircraft, which included Su-7 ground attack aircraft and first generation MiG-21 interceptors; SA-3 missiles that were operated by Soviet crews; SA-6, SA-7 and ZPU-23–4 AA guns; and T-54 and T-55 tanks.[48]

Israeli arms acquisition in the post-1967 period focused on substituting the old IAF aircraft with new American first-line ones, such as Skyhawks and Phantoms, and on purchasing new tanks, artillery, two submarines, and so forth. The fact that during the War of Attrition with Egypt Israel was using the IAF as 'flying artillery' due to lack of sufficient artillery units,[49] and was doubling the number of its tanks—1,700 in 1973 as compared to 990 in 1967[50]—are both evidence of this process. As a result

[45] *Der Spiegel*, 5 November 1969.
[46] Dan Schueftan, *Hatasha: Ha'estrategia Hamedinit shel Mitzrayim Hanatzerit Be'iqvot Milkhemet 1967* [Attrition: Egypt's Post War Political Strategy, 1967–1970, Tel-Aviv, Ma'arachot, 1989], 221, 223.
[47] Yaniv, *Politika Ve'estrategia Be'Israel*, 215.
[48] Luttwak and Horowitz, *The Israeli Army*, 300, 350.
[49] Yaacov Bar-Simon Tov, 'IAF Effectiveness During the War of Attrition', *Maarachot* 283 (1979), 45–50.
[50] Yaniv, *Politika Ve'estrategia Be'Israel*, 215–17, 253–4.

of the trauma of France's disengagement from its alliance with Israel at a critical moment on the eve of the 1967 war, Israel adopted a policy of security-industrial autonomy, which required investment in its own defence industry.

After the 1967 War, Israeli defence expenditures rose to 14 per cent of GNP in 1968, as compared to 11.1 per cent in 1967, and 21 per cent in 1969. In 1970 they declined to 16.4 per cent.[51] Israel fortified its defence lines both in the Sinai and the Golan Heights, hoping to deter the Arabs from initiating war in order to 'erase the consequences of the defeat in 1967'. After having spent hundreds of millions of dollars on the construction of the Bar-Lev line during the War of Attrition, it continued investing in its fortification, spending $500 million in 1971 alone.[52] Israeli defence expenditures, which between the Sinai War and the Six-Day War had averaged 9.3 per cent of GNP, rose to an average rate of 20.2 per cent of GNP in the period 1967–73.

TECHNOLOGY: THE ASCENDANCY OF FIREPOWER

Until 1967, the Arab–Israeli battlefield was manoeuvre-dominated, which served the Israeli offensive orientation. However, since the 1970s, firepower capabilities have gradually become dominant as a result of technological developments. With the ascendancy of firepower over manoeuvre, Arab state and non-state players found an efficient method of offsetting Israel's military edge, and this was reflected in the Arab–Israeli arms race.

Firepower in the Hands of Arab States

The Arab states that had been defeated by Israel on the battlefield in 1967 reached the conclusion that the most effective way of balancing their military inferiority vis-à-vis Israel was to acquire a varied range of rocket and missile capabilities. For example, Egypt now possesses a large inventory of short-range unguided missiles, alongside older SSMs and some Scud-Bs and Scud-Cs. Syria has a relatively large stockpile of medium and short-range Scud-B and Scud-C ballistic missiles, with large holdings of Multiple Rocket Launchers (MRLs). Although Syria's Scuds lack accuracy and ease of deployment, they can potentially be used as chemical or biological delivery systems. Syria has recently received new weapon systems from Russia, such as the SA-17, which is a mobile system with a range of some 50km, which is designed to protect ground forces; and the Bastion anti-ship system that uses the Yakhont supersonic cruise missile, which is designed to operate against ships, though it also has a certain capability against coastal land targets.[53] In contrast, Lebanon's MRL holdings are negligible, and Jordan has no SSMs.

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[51] Aryeh Shalev, 'The Arms Race in the Middle East in the 1980s)', in Zvi Lanir. ed., *Bitakhon Ve'calkalat Israel Bishnot Hashmonim* [Israeli Security Planning in the 1980s] (Tel Aviv, 1985), 22.

[52] According to Yohanan Bader, it spent only $300 million: Yohanan Bader, 'Masada Never Again', in Zvi Ofer and Avi Kober, eds., Mekhir Ha'otzma [The Price of Power] (Tel Aviv, 1984), 109.

[53] Yiftah Shapir, 'Syrian weapons in Hizbollah Hands', *INSS Insight* 404 (2013). http://www.inss.org.il/index.aspx?id=4538&articleid=2609.

Meanwhile, Israel has not been idle. It has acquired or developed modern short- and intermediate-range ballistic missiles. Its Jericho I and Jericho II SSMs are capable of delivering conventional, chemical, biological, or nuclear payloads up to a range of 500km and 1,500km respectively. Israel also has a large arsenal of short-range MRLs.

Firepower in the Hands of Non-State Players

As long as its counter-insurgency operations were based on manoeuvre, arms races between Israel and insurgents were of lesser relevance, and Israel could maintain its traditional edge over non-state players. This was reflected in 1978 (Operation Litani), 1982 (the First Lebanon War), 1993 (Operation Accountability), 1996 (Operation Grapes of Wrath), or 2002 (Operation Defensive Shield). But Arab non-state players can no longer be treated as almost irrelevant to the Arab–Israeli arms race, or identified with low-tech, as in recent decades they have been acquiring capabilities that in the past would have been found in the hands of regular armies, and with similar consequences. Palestinians and Hezbollah have become capable of attacking Israel's rear, demoralizing its civilians, and disrupting social and economic activities in northern or southern Israel, either by using artillery and Katyusha rockets, as they did during the 1981 'Small War of Attrition' between Israel and the PLO, or by employing simple and relatively cheap rockets of various ranges, such as the Qassam, Grad, and Fajr, as Hamas and Hezbollah have done in recent years. Their stockpile of missiles and rockets has been sufficient to launch dozens to hundreds of rockets a day over weeks of fighting.

Although there has still existed a gap in capabilities between Israel and the non-state enemies and Israel could win a war against them if it put its mind to it, this process has significantly blurred the power gap between Arab non-state players and Israel and has been a major factor in the emergence of the so-called hybrid wars, which are advantageous to the weaker side. Whereas up to the 1980s Israel was the deterring side and the Arabs were the deterred players, since the 1981 'Small War of Attrition' more symmetrical deterrence conditions have developed in which Israel has gradually been deterred by its Arab non-state enemies.

As was pointed out above, some reports indicate that Hezbollah already possesses some 80,000 surface-to-surface missiles and rockets, and is aiming at strengthening its SAM capabilities. Its largest rocket system is the 610mm Zelzal-2. Weighing some 3,400kg and capable of delivering a 600kg warhead in excess of 200km, the system's lethality and utility are limited by its lack of electronic guidance systems. Yet Hezbollah has also attempted to expand its holdings of guided rocket systems. The Fatah A-110, a guided version of the Zelzal-2, or the Syrian-made M-600, a Fatah A-110 clone, would present more of a threat to Israel's rear. There are also reports that Hezbollah has expanded its arsenal of advanced, longer-range anti-ship systems. In January 2013, it was reported that there had been an attempt to transfer sophisticated SA-17 systems from Syria to Hezbollah, which were destroyed en route to Lebanon by Israeli aircraft.[54]

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[54] *The Wall Street Journal*, 30 January 2013.

The main weapons sources for the Palestinians and Hezbollah have been Iran and Syria. Syria has provided Hezbollah with Scud-B missiles (and probably also Scud C or D) that possess the range and payload capability to hit any city in Israel; various types of rockets (122mm Grad rockets; the heavier Iran-made Fajr-3, Fajr-5, and Fateh 110; the Syrian-made 220mm and 302mm rockets, and Zelzal rockets); as well as anti-tank missiles of various kinds (including Kornet missiles), anti-ship missiles, and surface-to-air systems.[55] Iran, too, is reported to have provided Hezbollah with air-to-ground missile systems.

Of particular concern is Hezbollah's successful technological engagement in electronic warfare (EW) against Israel. During the Second Lebanon War, Hezbollah eavesdropped on Israeli communications networks and mobile telephones, including Israeli soldiers' conversations from inside Lebanon. According the *Center for Strategic and International Studies* report, American EW experts came to Israel to learn, among other things, how Hezbollah's Iranian EW systems neutralized Israeli EW; how Israeli EW systems failed in blocking Hezbollah's command and communications; and how Iranian EW, installed in Lebanese Army coastal radar stations, blocked the Barak anti-missile system aboard Israeli warships, allowing Hezbollah to hit the Israeli corvette *Hanith*.[56] Hezbollah also had advanced night-vision systems, such as thermal imaging night vision equipment, which disclosed IDF troop movements.[57]

Although the emergence of the above technologies does not threaten Israel's basic security, let alone its existence, they have increased Israel's efforts to field newer defensive counter-fire systems, such as the Trophy active protection system (APS) for Israeli armour, and a three-layer active counter-missile defence system—the low altitude Iron Dome, medium-range David Sling, and high-altitude Arrow II.

CONVENTIONAL VS. UNCONVENTIONAL ARMS RACE

As mentioned above, Israel's undeclared decision to go nuclear was driven by fear that in the long run it would be unable to sustain a conventional arms race with its Arab enemies. A combination of its traditional opacity policy and a consistent American anti-proliferation policy, has managed to avert a nuclear arms race in the region. At the same time, however, the fact that Israel has enjoyed a nuclear monopoly in the region can be considered one of the factors that have motivated other regional powers such as Egypt, Syria, Iraq, or Iran to consider the possibility of going nuclear.

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[55] Bret Stephens, 'Plotting the Next Mideast War', *Wall Street Journal*, 10 April 2010. *See also* Alon Ben-David, 'Going Ballistic: Syria Comes under Diplomatic Scrutiny for Allegedly Supplying Scuds to Hezbollah', *Aviation Week and Space Technology*, 19 (2010), 40–1; Shapir, 'Syrian Weapons in Hizbollah Hands'.

[56] Anthony H. Cordesman, *Preliminary 'Lessons' of the Israeli-Hezbollah War* (Washington D.C., 11 September 2006), 38. http://www.csis.org/media/csis/pubs/060911_isr_hez_lessons.pdf. See also Ofer Shelah and Yoav Limor, *Captives in Lebanon* (Tel Aviv, 2007), 288.

[57] Shelah and Limor, *Captives in Lebanon*, 333.

Should Iran become a nuclear power, Turkey, Saudi Arabia, and other Sunni regional players would have to choose between three options: first, balancing Iran directly, by developing a nuclear capability of their own, which means that an arms-race spiral would emerge; second, sheltering under the American nuclear umbrella, as Egypt benefited from a Soviet nuclear umbrella during the 1970s; and third, hoping that the US and/or Israel would destroy Iran's nuclear capability or prevent Iran from becoming a nuclear power by using soft power.

As far as the first option is concerned, in mid-2012 it was reported that in June 2011 Prince Turki al-Faisal, a former Saudi intelligence chief and ambassador to Washington, had warned senior NATO military officials that the existence of an Iranian bomb would compel Saudi Arabia to pursue policies that could lead to untold and possibly dramatic consequences. And in February 2012, the London *Times* quoted a senior Saudi official as saying that should Iran realize its ambition of obtaining a nuclear weapon Riyadh would retaliate with a 'twin-track nuclear weapons programme'. The programme would consist of purchasing warheads off the shelf from abroad and the upgrading of Saudi Arabia's civil nuclear programme to include a military dimension, beginning uranium enrichment to develop weapons-grade material in the long term.[58] It was only natural, therefore, that the Saudi threat would be one of the prime factors motivating the US to stop Iran's nuclear programme.[59]

Currently, the nascent nuclear arms race between Israel and Iran has been pushing Iran to develop and/or strengthen its long-range nuclear and conventional attack capabilities, and Israel to strengthen its missile defence capabilities[60] alongside its long-range offensive arm. Although a realist-school analysis would lead to the conclusion that any Iranian decision to attack Israel with nuclear weapons would be a decision to commit suicide, it would be unwise to ignore the threats coming from revisionist Iran to wipe Israel off the map. They will most probably encourage Israel to adhere to its nuclear capability, with all the potential repercussions of a nuclear arms race in the Middle East.

OUTCOMES: THE CONNECTION BETWEEN ARMS RACES AND WAR

Researchers have been divided on the connection between arms races and war. Experts like Lewis Richardson[61] or Michael Wallace[62] have argued that there has

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[58] 'Saudi Arabia threatens to go nuclear "within weeks" if Iran gets the bomb', *The Times* [London], 10 February 2012: http://www.thetimes.co.uk/tto/news/world/article3315479.ece.

[59] Chemi Shalev, 'Dennis Ross: Saudi King Vowed to Obtain Nuclear Bomb after Iran', *Haaretz*, 30 May 2012.

[60] Anthony H. Cordesman, A. A. Burke, and Aram Nerguizian, *The Arab–Israeli Military Balance* (Washington D.C., 2010), 2.

[61] Richardson, *Arms and Insecurity*.

[62] Michael D. Wallace, 'Arms Races and Escalation: Some New Evidence', *Journal of Conflict Resolution* 23/1 (1979), 3–16; Michael D. Wallace, 'Some Persisting Findings', *Journal of Conflict Resolution* 24/2 (1980), 289–92; Michael D. Wallace, 'Armaments and Escalation', *International Studies Quarterly* 26/3 (1982), 37–56; Paul F. Diehl, 'Arms Races and Escalation: A Closer Look', *Journal of Peace Research* 20/3 (1983), 206–12.

been a strong relationship between the two. Others have claimed that arms races affect the likelihood of war via factors such as a dominant role played by the military in the decision-making process on war and peace,[63] misperception,[64] weak deterrence,[65] the decision-makers' risk orientation,[66] etc. Another aspect referred to by researchers is timing. It has been claimed that arms races sometimes create transitory advantages that might be interpreted as short-term windows of opportunity to use force,[67] and that the early stages of an arms race are most tempting for the launch of preventive war or pre-emptive attack.[68]

The Arab–Israeli case does not seem to lead to any clear-cut conclusion on the direct or indirect impact of arms races on war, and can hardly help determine which of the above approaches has more strength both theoretically and empirically. Some of the Arab–Israeli HIC arms races contributed to the outbreak of war (1956, 1967, and 1973), while others did not. Such a connection was mostly absent from the Arab–Israeli LIC arms races; not even a single war broke out as a result of arms racing between Israel and Arab non-state players, although non-state players have acquired technologies that have strengthened their self-confidence vis-à-vis Israel.

As for the role played by the Israeli military in moving from arms race to war, in 1956 it played a major role in such a process. In another case—the 1967 Six-Day War—it pushed for war by contributing to the escalation on the Syrian border prior to the outbreak of war, and later on it pressured the political echelon to approve a pre-emptive strike when the Egyptian Army and the IDF were already deployed along the border, although the war did not break out as a direct result of the dynamic created by the arms race.[69]

In one case only did war break out once a window of opportunity opened in the midst of an arms race: in 1956, when Israel decided to initiate a preventive war against Egypt once an opportunity had been created to join France and Britain in a war coalition.

Huntington's claim that wars are likely to occur during the early stages of an arms race has been substantiated only once in the Arab–Israel case—in 1956. Israel's objective in the Sinai War was to attack before the Egyptians had absorbed the new arms from the Czech–Egyptian arms deal. In contrast, the 1967 war example challenges Huntington's assertion, as Israel's pre-emptive attack was landed after years of arms race between the parties.

Revisionism-driven arms races have always ended up in the initiation of war by the 'greedy' player. The Arabs initiated war against the nascent state of Israel in

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[63] Philip Noel-Baker, *The Arms Race: A Programme for World Disarmament* (London, 1958).

[64] Jervis, *Perception and Misperception in International Politics*.

[65] Erich Weede, 'Arms Races and Escalation: Some Persisting Doubts', *Journal of Conflict Resolution* 24/2 (1980), 285–7.

[66] James D. Morrow, 'A Twist of Truth: A Reexamination of the Effects of Arms Races on the Occurrence of War', *Journal of Conflict Resolution* 33/4 (1989), 500–29.

[67] *Ibid.*

[68] Samuel P. Huntington, 'Arms Races: Prerequisites and Results', *Public Policy* 8 (1958), 41–86.

[69] Golani, 'The Historical Place of the Czech-Egyptian Arms Deal'; Interview with Moshe Dayan by Rami Tal. http://www.hagalil.com/GuShalom/maamarim/dayan.htm.

1948 in order to eliminate it. Each of the two major war coalition members—Egypt and Jordan—planned to dominate Palestine, either by annexing it (Jordan) or by turning it into a puppet state (Egypt). In the post-1967 period the Arab states that had lost territory in 1967 wished to reverse the *status quo ante* in the West Bank, Gaza, and the Golan Heights. Their intensive military build-up was supposed to enable them to achieve that goal, and the 1969/70 War of Attrition and the 1973 October War should be seen as stages in their plan to force Israel to withdraw from the occupied territories.

In some cases (1956 and 1967) the security dilemma dynamic had an influence on the outbreak of war. After 1973, Israel's effort to double its military's size and to upgrade its quality, in order to defend on multiple fronts simultaneously, required a military build-up, but was not translated into war, as the peace process moderated the arms race. After 1973, to a great extent as a result of the Israeli–Egyptian peace, no arms race ended up in an Arab–Israeli war. In the wake of the air campaign during the 1982 War, Syria developed a missile and rocket capability that would threaten the Israeli rear and balance Syria's weakness in the air. This led to the acquisition of a missile defence capability on the Israeli side that was also destined to cope with Iranian, Hezbollah, and Palestinian missiles and rockets, but did not ignite war between Israel and Syria.

This shift from a bipolar, Arab–Israeli arms race, towards regional arms races has overshadowed the Arab–Israeli arms race, diverted attention to other areas, and seems to have decreased the risk of war between Arabs and Israelis.

The combination of Israel's commitment to maintain its nuclear monopoly in the Middle East, Iran's nuclearization, and the obligation of leading Arab countries such as Egypt and Saudi Arabia to maintain their regional role and status may push them to go nuclear. This would be bad news for the security of the region. Israel and/or the US might opt for a preventive strike or pre-emptive attack in order to stop the nuclearization of the region.

During the Cold War, the superpowers armed their local clients as part of their commitment to them as patrons, thereby increasing the chances of war. The patrons, however, could not always veto war initiatives by their clients, as for example in 1973, when the Soviets were unable to prevent the Arab initiation of war, which the Arabs considered as serving their vital interests. The US has never supported Arab wars against Israel, and when it became the only superpower and arms supplier to Egypt, Saudi Arabia, and other Arab states, its influence on its Arab and Israeli client states increased, so that the likelihood of the Arab–Israeli arms race deteriorating into war has been reduced significantly.

CONCLUSION

The Arab–Israeli arms race has gone through several shifts: a shift from HIC-based arms races to LIC-based races; from a bipolar, Arab–Israeli arms race to a regional arms race; from a conventional to an unconventional arms race; and from a Middle Eastern arms race that reflected the global arms race to one more detached from it.

The Arab–Israeli arms race has been affected by external and internal factors. Three main external factors were first, great-power arms sales. Examples of this factor include the Soviet arms supply to Israel via Czechoslovakia in 1948, the 1955 Soviet/Czech–Egyptian arms deal, arms supply by the Soviets to Egypt and by France to Israel in the 1960s, arms supply by the USSR to Egypt and Syria following their defeat in 1967, and by the US to Israel after the 1967 war. Second, regional rivalries. A more recent example of the impact of this factor on the Arab–Israeli arms race has been Iran's efforts to become a leading regional power. This has accounted for its military build-up and nuclearization, which in turn stimulated a balancing build-up process in Israel and the Gulf states. Third, a security dilemma dynamic. There are plenty of examples of a spiral process as a result of this factor: the Czech–Egyptian deal and the French–Israeli deal before the1956 Sinai War that followed from a strong Egyptian and Israeli sense of insecurity; Egypt's military build-up in the wake of the Egyptian defeat in that war, which prompted an Israeli build-up in response; the Israeli build-up after the 1973 October War as a result of the IDF's quantitative inferiority during that war, which triggered a military build-up on the Arab side; or the Syrian decision to develop a missile capability with the aim of threatening the Israeli rear and balancing the Syrian weakness in the air that had been demonstrated during the 1982 First Lebanon War. In turn, the latter accelerated Israel's efforts to develop and deploy anti-missile systems that would also help it cope with Iranian, Hezbollah, and Palestinian missiles and rockets.

The main internal factor was the revisionist aspirations of the players. There were two examples of revisionism. The first is provided by the 1948–9 Israel's War of Independence, when a coalition of Arab states attacked Israel in order to prevent the establishment of a Jewish state, and brought about an accelerated military build-up on the Israeli side during the war in order to counter the Arab edge in weapon systems. The second example is the post-1967 period. From the Arabs' point of view, the Arab–Israeli arms race was driven by what they considered Israeli expansionism. The Israelis, on the other hand, believed that the Arabs were the revisionists, who challenged the *status quo ante* by trying to force Israel to withdraw to the pre-1967 lines.

Technology, particularly the ascendancy of firepower over manoeuvre since the 1970s, has also played a major role in the Arab–Israeli arms races. The weaker side has employed technology as a force multiplier in order to balance, at least to some extent, Israel's technological advantage. Earlier, a strong sense of pessimism regarding its ability to sustain a conventional arms race with its Arab enemies in the long run was the major reason for Israel's decision to go nuclear.

A connection between arms races and war was evident in the revisionism-driven Arab–Israeli arms race in 1948 and during the post-1967 period, as well as in the security dilemma-driven arms race in 1956. However, the Arab–Israeli case does not seem to lead to any clear cut conclusion regarding the direct or indirect impact of the other factors in the arms race that have been suggested in the theoretical literature, such as a dominant role played by the military in the decision-making process on war and peace (Philip Noel-Baker), misperception (Robert Jervis), weak

deterrence (Erich Weede), decision-makers' risk orientation (James Morrow), and the role played by timing—the creation of a window of opportunity, particularly during the early stages of an arms race (Huntington).

A connection between arms races and war was mostly absent from the Arab–Israeli LIC arms races; not even a single Arab–Israeli war broke out as a result of arms racing between Israel and Arab non-state players, although non-state players have acquired technologies that have strengthened their self-confidence vis-à-vis Israel.

Map 5. Kashmir Region

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Arms and Assistance in South Asia 1953–1965
Why Racing Alone Explains Little

Rudra Chaudhuri

On 24 November 1962, a report compiled by the Indian Planning Commission argued that for India to survive, 'estimates of expenditure and of foreign aid would have to be substantially increased'.[1] The urgency underlying the message at hand could not have been more explicit. Five days earlier, on 19 November, Jawaharlal Nehru authored what was perhaps *the* most significant letter of his lifetime. It was unquestionably the most significant during his seventeen-year tenure as prime minister. Nehru appealed to President John F. Kennedy to order the United States military to intervene on India's behalf against the People's Republic of China (PRC). The People's Liberation Army (PLA) was well inside Indian Territory. It had occupied the Aksai Chin, the high wastelands located in the extreme northeast of Kashmir. Moreover, Chinese troops had stormed across the disputed 700-mile border (the McMahon Line) on India's North East Frontier. The situation, according to the prime minister, was 'really desperate. [...] Unless something is done immediately to stem the tide,' he argued, 'the whole of Assam, Tripura, Manipur, and Nagaland would also pass into Chinese hands'.[2] Two days later, the PRC announced a unilateral ceasefire, leaving India a changed nation. To deter future Chinese attacks, the Planning Commission report stressed, 'Excess of what our [Indian] factories can produce will be obtained from abroad. [...] An effective defence against massive aerial warfare,' it concluded, 'cannot be achieved by indigenous efforts.'[3]

The desperate need for arms from abroad led to one of the largest injections of defence equipment into South Asia since the partition of India and Pakistan in 1947. Without doubt, it rattled Mohammad Ayub Khan, the self-appointed

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[1] Nehru Memorial Museum and Library, New Delhi, India, [hereafter NMML] Pitambar Pant, 'Defence Needs and Economic Policy', Planning Commission, appendix attached to a letter from Tiruvellore Thattai Krishnamachari [hereafter TTK] to Nehru, 24 November 1962, TTK Papers, Correspondence with Nehru.

[2] John F. Kennedy Presidential Library & Museum, Boston MA, USA [hereafter JKLM], Nehru to Kennedy, 19 November 1962, NSC Box 111. Part of the contents of this letter was revealed only in 1965. *See* Sudhir Ghosh, *Gandhi's Emissary* (London, 1967), 309.

[3] NMML, Pitambar Pant, 'Defence Needs and Economic Policy', Planning Commission, appendix attached to a letter from TTK to Nehru, 24 November 1962, TK Papers, Correspondence with Nehru (emphasis added).

president of Pakistan. As the Chief of Army Staff, and prior to the army-led coup in 1958 that had cleared the way for his political ambitions, Ayub had worked tirelessly to enter into a mutual defence pact with the Eisenhower administration. He had even travelled to the United States to make a case for the agreement, without prior approval from the political executive.[4] Arms deliveries to India were hardly welcome to someone representing a nation widely recognized as 'America's most-allied ally in Asia'.[5] Washington, Ayub perceptively argued, read New Delhi's predicament as a 'good opportunity to get India in the bag'.[6]

Importantly, and unlike previously, Washington—and the Johnson White House in particular—was reluctant to invest political capital in a peace process. President Johnson made clear that rather than getting directly involved, the US should focus on 'supporting the UN', arguing that 'We should hide behind that log.'[7] In short, Kashmir was considered a 'plague-on-both-their-houses' problem for both India and Pakistan, one which Washington insiders and observers thought unresolvable. Ignored, disappointed, and aware of the rapid pace of India's armament programme following defeat in 1962, 'Pakistan', as Stephen Cohen put it, 'initiated the 1965 war with India'.[8] 'A "now or never" mentality,' as another scholar suggests, 'gripped the decision-makers in Rawalpindi.'[9] The 'window of opportunity' was said to be 'narrowing with India's growing military strength'. The bottom line, as Pakistani scholars point out, was that 'Pakistan was running out of time if it wanted to effect a military-induced solution to the Kashmir imbroglio.'[10] Clearly, the imperatives underlying military competition occupied a position of centrality in such assessments.

That the so-called window of opportunity was in fact closing is borne out by statistical data. Whilst Pakistan's military expenditure between 1960 and 1965 increased by approximately $400 million, India increased its spending to more than $2 billion. Between 1963 and 1965, or the two years that witnessed an increase in arms sales in South Asia, India outspent Pakistan—in terms of expenditure on arms imports—by nearly $300 million.[11] Further, and as one of India's only defence economists argues, humiliation in 1962 gave rise to a 'new defence consciousness in the country…' It led to a commissioning of the first Five Year

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[4] Ayesha Siddiqa, *Military Inc.: Inside Pakistan's Military Economy* (London, 2007), 71.

[5] Robert J. McMahon, 'United States Cold War Strategy in South Asia', *The Journal of American History* 75/3 (1988), 812.

[6] The National Archives, Kew, United Kingdom, [hereafter TNA] F[oreign]O[ffice] 371/170638, record of conversation between the foreign secretary and the president of Pakistan, President's Palace, 1 May 1963.

[7] Memorandum for record, Washington, 2 September 1965, *Foreign Relations of the United States* [hereafter FRUS], *South Asia* 1964–1968, Volume XXV [Hereafter Volume XXV] (Washington, 2000), p. 73.

[8] Stephen P. Cohen, *The Pakistan Army* (California, 1984), 139.

[9] Sumit Ganguly, *Conflict Unending: India-Pakistan Tensions since 1947* (New Delhi, 2002), 31.

[10] Shuja Nawaz, *Crossed Swords: Pakistan, its Army and the Wars Within* (New York, 2008), 20–3.

[11] S. Deger and S. Sen, 'Military Security and the Economy: Defence Expenditure in India and Pakistan' in Keith Hartley and Todd Sandler, eds., *The Economics of Defence Spending: An International Survey* (London, 1990), 197–8. Note: These figures are calculated on 1980 currency exchange rates.

Defence Plan (1964–9),[12] with an initial demand to almost triple the defence budget.[13] None of this eluded Ayub Khan.[14]

The wider literature on the causal connections between arms races and war might also suggest that an apparent 'race'—between 1957 and 1964—led to the 1965 India–Pakistan conflict. Classified as a 'war-prone race', experts point to the inevitability of war driven by spiralling military competition.[15] Regionalists and historians also point to the importance of domestic factors within India and Pakistan and the deep-seated historical differences between the two states—such as over the conflict in Kashmir. These considerations, observers of South Asian security stress, 'tend to be more important' than a 'dyadic relationship' exemplifying the so-called action-reaction model typified in the early works on arms races or as popularized by Lewis Fry Richardson.[16] In fact, beyond what might at best be considered a distant and abstract view of the arms race in South Asia, there is little or no empirical evidence to suggest that military competition alone—whether as a result of reacting to the other's intentions and procurement practices or because of internal pressures shaped by the political economy of the arms trade—led to the 1965 war.

Indeed, in contrast to some explanations of the outbreak of the Second World War, there was no question of a race spiralling 'out of control'.[17] In fact, in the case of India and Pakistan, the nub of the debate around arms racing, that is, 'whether or not arms racing is an independent phenomenon with distinctive and significant consequences',[18] has been left open. There is no major historical work on the influence of conventional arms and arming on political decision-making in the subcontinent. South Asia—at least post-1947—has yet to discover its own A. J. P. Taylor or Hugh Trevor Roper. For that matter, journalists—such as David Hoffman in the Anglo-American context—have also failed to tell the history and story of two arsenals that at the present day cater to a combined strength of nearly 1.7 million soldiers on active duty.[19] In the first decade of the twenty-first century, India became one of the largest weapons buyers in the developing world.[20] Yet two fundamental and contrasting propositions—whether arming shapes political outcomes or politics determine the contours of military competition—remain woefully under-explored.

[12] Debra R. Mohanty*, Arming the Indian Arsenal: Challenges and Policy Options* (New Delhi, 2009), 84–5.

[13] Note: The Five Year Plan initially demanded 5.9% of India's GNP, *see*: 'Memorandum for Record between Robert McNamara and Chester Bowles', 31 March 1964, *FRUS,* Volume XXV, p. 73.

[14] Stephen P. Cohen, 'US Weapons and South Asia: a Policy Analysis' *Pacific Affairs* 49/1 (1976), 49–69.

[15] Theresa C. Smith, 'Arms Race Instability and War', *Journal of Conflict Resolution,* 24/2 (1980), 259–63; Hakan Wiberg, 'Arms Races – Why Worry?', in N. Peter Gleditsch and Olav Njolstad, eds., *Arms Races: Technological and Political Dynamics* (London, 1990), 371.

[16] Deger and Sen, 'Military Security and the Economy', 219.

[17] Joseph A. Maiolo, *Cry Havoc: The Arms Race and the Second World War 1931–1941* (London, 2010), 2–3.

[18] Barry Buzan and Eric Herring, *The Arms Dynamic in World Politics* (London, 1998), 75.

[19] *The Military Balance 2012* (London, 2012), 243, 272.

[20] Andrew Feinstein, *The Shadow World: Inside the Global Arms Trade* (London, 2011), 529.

THE ARGUMENT

This paper sets out to test the above-mentioned propositions. Broadly, it argues that military competition between India and Pakistan can at best be understood as a marker of the deep-seated disaffection sowed as a result of the division of the former princely state of Kashmir. The search for, acquisition of, and desire for arms did not in themselves lead to the outbreak of war. The paper makes two inter-related arguments. First, the very notion of a 'race' requires further investigation. Was a race really underway? According to common and accepted definitions, 'the idea of a race suggests two or more states strenuously engaged in a competition to accumulate military strength against each other'. The fear of the others' military potential sustains this competition. The outcome, as Barry Buzan and Eric Herring make clear, may be for one party to achieve a 'decisive change in the balance of military power'.[21] While there is overwhelming evidence to suggest that Pakistani strategic priorities were centred on and around the 'fear' of India's military poten-tial, there is less clear evidence that concerns about Pakistan determined India's arms procurement objectives. If anything, Indian elites trained their eyes on China. An arms build-up can hardly be said to have spun into a race towards war.

As the more nuanced work on South Asia nuclear politics underscores, India and Pakistan might have been racing, but they did so 'on different tracks and chas-ing very different goals'.[22] These qualified conclusions are not all that different from those regarding conventional armaments. Further, down to 1965, although the two countries made considerable investments in indigenous military produc-tion facilities, they produced little. Between 1960 and 1963, India made no major or 'big-ticket' investments in the domestic arms industry,[23] even though its first ordnance factory had been constructed as early as 1801.[24] In fact, 'domestic struc-ture' approaches seem to have little applicability to the study of arms competition in South Asia. Such approaches focus on pressures and constraints shaped by domestic arms production, research and development, economic management, and the military-industrial complex. As Buzan and Herring underline, however, there is little scholarship on states that lack major and effective indigenous arms production facilities, and India and Pakistan are two such states. In fact the 'arms dynamic', to use Buzan and Herring's broader terminology for arms racing, can be said to have played *a* role but not *the* role in determining outcomes such as the outbreak of war in South Asia in 1965.

As this paper shows, in the case of the 1965 war, both the general influence of the armaments balance and more specifically the perceived high rate of arms imports into India did not in themselves play key roles in causing military intervention in Kashmir. The argument that there was an apparently fast-closing 'window of oppor-

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[21] Buzan and Herring, *The Arms Dynamic*, 75.
[22] Toby Dalton and Jaclyn Tandler, 'Understanding the Arms "Race" in South Asia', *The Carnegie Papers* (2012), 4.
[23] Deger and Sen, 'Military Security and the Economy', 197.
[24] Mohanty, *Arming the Indian Arsenal*, 84–5.

tunity' and the more deterministic way in which some scholars have chosen to interpret the reasons for war in 1965 remain under-tested. As the narrative below demonstrates, the outbreak of war had more to do with the Pakistani regime's almost complete lack of strategic appreciation of the Indian Army's ability to escalate a localized conflict—in Kashmir—into all-out war across the International Border. This was a war that Ayub Khan, his corps commanders, and even his Chief of Army Staff did not want or even envisage. However, if the side with an interest in exploiting a fast-closing 'window' did not actually want war or to risk war, then how exactly can the 1965 case be understood as an outcome of an arms race? As this paper argues, a specific set of conditions led to the outbreak of war in that year.

First, by 1965 Pakistani elites in fact understood that the so-called window had shut. War with India would be foolhardy. Rather, changing patterns of external military and political assistance between 1962 and 1963 pushed Pakistan to consider a limited intervention—localized within Jammu and Kashmir—that was *never* meant—in Pakistan's assessment—to lead to all-out war. Second, their perception of India as being vulnerable and disorganized following its defeat in 1962 and a less-than-convincing Indian show of strength in a skirmish—between Indian and Pakistani regular forces—in the spring of 1965 persuaded the Pakistani military *and* civilian leadership to favour such an intervention. Third and finally, the intervention was tailored to complement what Pakistani planners mistakenly thought to be a rise in internal strife within Indian-administered Kashmir. The end result as they saw it would be rebellion within Jammu and Kashmir. Bizarrely, war with India was never even seriously considered as a potential consequence of intervention. In short, this was less about arms and racing and more an effort to achieve limited objectives within Jammu and Kashmir that, according to Pakistani planners, was never meant to escalate to a level where Pakistani regular forces would be found fighting the Indian Army within reach of Lahore.

With a view to providing a closer analysis of the relevance of the debates on arms races to the South Asian case, this paper focuses on the period between 1953 and 1965. In 1954 the United States and Pakistan entered into a major defence treaty, leading to the first major injection of arms in South Asia. On the other hand, the years 1962–3 witnessed the second largest import of arms, which allegedly led to war in 1965. The paper is divided into two parts. First, it scrutinizes the defence relationship between the United States and Pakistan in the 1950s, as well as Indian elites' reaction to that relationship, highlighting how and why political imperatives conditioned and controlled a dynamic that did not develop into a race. Second, the paper focuses on the aftermath of the Sino-Indian border dispute and the outbreak of war in 1965.

1953 TO 1962: A NON-RACE

Setting the Context

'If there isn't going to be a ceasefire,' Nehru told General Roy Butcher—the first Commander-in-Chief of the Indian Army—'we [India] may be faced with an

advance into Pakistan and for that we must be prepared.' This exchange took place in the latter half of 1948, as Indian and Pakistani forces battled for the future of Kashmir. In fact, despite the prime minister's directive, there was little that a recently independent Indian Army could have done. The country was not, as Butcher argued, 'in an advantageous position for going to war against Pakistan'.[25] As Lorne Kavic suggests, India may have had six infantry divisions and one armoured division in deployment, but these were 'still in the process of consolidation',[26] a point reinforced by the select few in the 1960s within India who followed defence-related matters.[27] In fact, although the Indian Army outnumbered Pakistan's by a 2:1 ratio,[28] Pakistan was left with a more senior and capable officer cadre following partition.[29] The following table surveys the division of military labour as decided by the Partition Council and specifically by the Armed Forces Reconstruction Committee (Table 10.1).

By December, a stalemate pushed both sides to consider a ceasefire, and at about midnight on 31 December 1948 one finally came into force. The former princely state of Jammu and Kashmir was divided in two: roughly a third being administered by Pakistan—the territory called *Azad* (free) Kashmir—and the remaining two-thirds by India, the state of Jammu and Kashmir or J&K. These dividing lines sowed the seeds of antagonism that continue to shape Indian-Pakistani relations. India was soon and widely considered as the status quo actor—largely satisfied with the geography of the ceasefire line (CFL). Pakistan came to be seen as a revisionist power, dissatisfied with a line it had recognized but wanted erased. Its desire for the whole of Kashmir has remained the chief

Table 10.1. Indian and Pakistani Military Balance in 1947

Equipment and Forces	India	Pakistan
Army	410,000	140,000
Infantry Regiments & Battalions	15 Regiments with 88 Battalions	8 Regiments with 33 Battalions
Armoured Corps	12	6
Artillery Units	18 ½	8 ½
Engineer Units	61	34
Sloops (including minesweepers and survey ships)	3	1
Fighter Squadrons	7	2
Transport Squadrons	1	1

Sources: this table has been compiled on the basis of a survey of: Khera, *India's Defence Problem*, pp. 27–33, Ayesha Jalal, *The State of Martial Rule: The Origins of Pakistan's Political Economy of Defence* (Cambridge, 2007), pp. 35–60.

[25] NMML, Oral history interview with General Roy Butcher, Oral History Section, Document No. 59.
[26] Lorne J. Kavic, *India's Quest for Security: Defence Policies, 1947–1965* (Berkeley CA, 1967), 85.
[27] Sucha S. Khera, *India's Defence Problem* (New Delhi, 1968), 37–40.
[28] Kavic, *India's Quest for Security*, 82.
[29] NMML, Oral history interview with General Roy Butcher, Oral History Section, Document No. 59.

rallying cry amongst both political and military elites.[30] It led Ayub to enter into military alliances led by the United States and Britain and to acquire an arsenal for war. For their part, and despite their apparent disadvantage in 1948, Indian leaders set out to temper and place brakes on an arms build-up that could well have led to a race of epochal proportions. The following narrative shows exactly how and why Pakistan's urgent quest for arms prompted little reaction from New Delhi.

The Rationale for Arms

In October 1954, the United States Congress authorized and allocated $171 million for military assistance to Pakistan to be spread over the next three and a half years.[31] Moreover, the Eisenhower administration was to provide $730 million worth of offensive military equipment—M-47/48 Patton tanks, F-86 Sabre fighter aircraft, F-104 Starfighter combat aircraft—and a further $1.3 billion for logistical support systems, communications equipment, and training.[32] The so-called Mutual Defence Pact with Pakistan was formally concluded on 19 May 1954,[33] some four months after Pakistani Prime Minister Mohammad Ali had made an official request.[34] In fact, the question of whether such assistance should be extended to Pakistan had already been considered immediately after Pakistani independence.

In 1948, Colonel Nathaniel R. Hoskot, the American military attaché in Karachi, had pleaded that military aid should be given to Pakistan because of its 'strategic worldwide importance'. In March 1949 a United States Joint Chiefs of Staff study concluded that the Karachi and Lahore area 'might be required as a base for air operations against Central USSR and as a staging area for forces engaged in the defence or recapture of Middle East oils'.[35] By the early 1950s, the idea of arming Pakistan was being seriously considered by General Omar Bradley (the Chairman of the JCS). American diplomats in and around South Asia agreed. 'Pakistan,' they argued, 'could provide important ground forces […] for use in South Asia or on the Western flank.' It was hence imperative, they concluded, 'to bring about an early build-up of Pakistani ground forces assisted by the provision of military equipment to Pakistan'.[36]

By the summer of 1951, and despite British hesitation about endorsing a plan of action that could isolate India, the US State Department was convinced about

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[30] For a cursory survey see Sumit Ganguly, *The Crisis in Kashmir: Portents of War, Hopes of Peace* (Cambridge, 1997), 1–13.

[31] Robert J. McMahon, *Cold War in the Periphery: The United States, India, and Pakistan* (New York, 1996), 195.

[32] Raju G. C. Thomas, 'Security Relationships in Southern Asia: Differences in the Indian and American Perspectives', *Asian Survey* 21/7 (1981), 699.

[33] For details see: Robert J. McMahon, 'United States Cold War Strategy in South Asia: Making a Military Commitment to Pakistan, 1947–1954', *The Journal of American History* 75/3 (1988), 812.

[34] 'Pakistan Asks US for Arms Aid', *Washington Post*, 23 February 1954.

[35] McMahon, 'United States Cold War Strategy in South Asia', 817–18.

[36] South Asia regional conference of United States diplomatic and consular officers, Ceylon, 26 February–2 March 1951, *FRUS*, *South Asia: 1951*, Volume VI/2 [Hereafter Volume VI/2] (Washington, 1977), p. 1666.

the imperative of supporting Pakistan. As the then US Assistant Secretary of State underlined: 'without Pakistan, I don't see any way to defend the Middle East'.[37] Washington placed its bets on Karachi—then the Pakistani capital—and specifically on the military. Dwight D. Eisenhower's electoral victory in the 1952 presidential election strengthened this line of argument. For John Foster Dulles, the new Secretary of State, the idea was to be 'tougher on Communism' than the Truman administration had been. This, as Nehru's sister pointed out, meant that a 'tilt' towards Pakistan was imminent.[38]

The Rationale for Non-Competition

For India, the repercussions were potentially colossal. Ayub's army, as it might have been called, was to be rapidly modernized. Four infantry and one-and-a-half armoured divisions were to be refitted with American equipment. These deliveries, according to the agreement, would be 'topped-up' as required. 'Pakistan's military potential' as Morrice James—then a 36-year-old British official who later became High Commissioner to Pakistan—argued, 'was greatly enhanced'.[39] As outlined in Table 10.2, American arms poured into Pakistan.

Nehru was clear that Pakistan's alliance with the United States would have 'far-reaching consequences for India'. It meant that the 'Cold War had come right to our [India's] North-Western frontiers'.[40] All 'our problems', he argued, would 'have to be seen in a new light'.[41] Nehru was also aware that India's 'armour was old and not adequate', especially when compared to the 'latest type of armour in large quantities and plenty of new aircraft' that were being given to Pakistan.[42] Yet, there was little India could do. Three factors exercised Nehru and his Cabinet more generally, pushing them to tread cautiously when it came to expanding India's arsenal.

The first restraining factor was the need to avoid over-dependence. Much of the early 1950s was spent negotiating food assistance with the United States. Given Nehru's determination to avoid over-dependence, requesting military aid as well was out of the question. In the post-independence period, 85 per cent out a total population of 350 million Indians lived with inadequate irrigation facilities. If India was to avoid famine, importing wheat was essential. In July 1947, Nehru told Henry Grady—the first American Ambassador to India—that America was the only country that could give India the economic aid and produce needed to

[37] McMahon, *Cold War in the Periphery*, 139–50.
[38] John Foster Dulles had taken over as Secretary of State from Chester Bowles. V. L. Pandit, *The Scope of Happiness: A Personal Memoir* (London, 1979), 258.
[39] M. James, *Pakistan Chronicle* (London, 1993), 20–1.
[40] Nehru to Chief Ministers, 27 January 1953, Nehru, *Letters to Chief Ministers*, Vol. 3, pp. 236–7.
[41] Nehru to Asif Ali, 10 November 1953, *Selected Works of Jawaharlal Nehru* [Hereafter *SWJN*] Vol. 24, p. 416.
[42] NMML, Subimal Dutt to G L. Mehta, New Delhi, 14 March 1956, G. L. Mehta Papers, III and IV Instalments.

Table 10.2. American Arms Transfers (on Aid Basis) to Pakistan Between 1954 and 1965

Numbers ordered	Description	Delivered
80	F-86 F Sabre/Fighter aircraft	1956–8
40	F-86 F Sabre/Fighter aircraft	1956–8
15	T-33 A Shooting Star/Training aircraft	1955–6
8	Adjutant/Minesweeper	1955–63
300	M-101A1 105mm/Towed gun	1955–7
4	HU-16B Albatross/Transport	1956–7
6	RT-3A T-Bird/Reconnaissance aircraft	1957
8	S-55/H-19 Chikasaw/Helicopter	1958
60	O-1/L-19 Bird Dog/Light aircraft	1957–8
26	Canberra B-57B/Bomber aircraft	1959
2	AN/FPS-20/Air search radar	1960
2	AN/FPS-6/Height-finding radar	1960
27	T-37B/Trainer aircraft	1962–4
4	C-130B Hercules/Transport aircraft	1963
18	Bell-47/OH-13/Light helicopter	1964

Source: SIPRI Arms Transfer Database, accessible at: http://armstrade.sipri.org/armstrade/page/trade_register.php.

avoid famine.[43] There was no likelihood of grain imports from the Middle East and Australia.[44] Importantly, there was also no indication that Russia would provide assistance, a request for food grains prior to independence having evoked no reply.[45] The calamitous food situation was made worse by India's early fiscal imbalance. Loy Henderson, Grady's successor, estimated the deficit to be as high as $135,000,000.[46] The Economic Department in the Commonwealth Relations Office (CRO) stressed that 'India will not be able to raise locally more than a quarter of the cost of internal expenditure on development.'[47]

Further, the International Bank for Reconstruction and Development (IBRD) made clear that it could not authorize loans of more than $150 million to India, which barely covered 25 per cent of what India needed from the IBRD.[48] The Export–Import Bank resisted giving India additional loans to meet the deficit in food grains. Even the International Monetary Fund (IMF), according to British officials in Delhi, had 'shown no desire to continue to permit India to purchase dollar[s] for rupees'.[49] In the next five to seven years, India would need foreign investments amounting to no less than £700 million.[50] In short, the need for

[43] Grady to State, New Delhi, 9 July 1947, *FRUS India* 1948, Volume III [Hereafter Volume III] (Washington, 1977), p. 58.
[44] Grady to Secretary of State, 2 September 1947, *FRUS* Volume III, pp. 164–5.
[45] Nehru Note: 'Food Grains from Russia', 6 September 1946, *SWJN-SS* 1, 481–2.
[46] The National Archives, College Park, Maryland, [Hereafter NARA] Memorandum of Conversation between John Mathai and Henderson, 12 September 1949, RG59/File 67044/Box 1.
[47] TNA, D[ominions]O[ffice] 35/2921, CRO to Washington, 2 September 1949.
[48] TNA, FO 371/76102, UK High Commission in India [Hereafter HC] to CRO, 25 July 1949.
[49] TNA, FO 371/76102, Acting High Commissioner in India to CRO, 25 July 1949.
[50] TNA, DO 35/2921, CRO to Washington, 2 September 1949.

American assistance for urgent and internal financial reasons appears to have partially informed Nehru's disinterest in anything even closely resembling a race for arms.

The prime minister was equally moved by his personal and self-acquired conviction that non-alignment was the wisest way forward. In his usual exuberant style, he argued that if India were offered assistance, it would reject it. In Parliament, he stated that external assistance of this sort is a 'dangerous thing'. In a particularly emotional outburst, he made plain that by 'relying on others' a nation could 'lose' its 'spirit'. 'If India,' he continued, 'loses her soul what would it profit her who defends it?'[51] To be sure, this was long before the 1962 war, and such language would be dropped in its aftermath. For the time being, however, Nehru rejected an offer by Eisenhower, who pledged his administration's 'sympathetic consideration' should India too want military assistance.[52]

The second restraining factor was the fact that Nehru remained wary of asking the Soviets for assistance. This was not because India did not think it necessary in the mid-1950s to acquire arms, but because—much as with the need to avoid over-dependence on the United States—the prime minister was concerned about growing Soviet influence in India's domestic affairs. An arms agreement with Moscow, Nehru reasoned, might well strengthen the Communist Party of India (CPI). Although Nehru found it increasingly difficult to gauge what principles informed the CPI's decision-making process, he was constantly aware that the CPI, with its Moscow connection, worked to check government decisions. Further, following the announcement of the Defence Pact with Pakistan, the communists launched a frontal attack against the government. Hirendranath Mukherjee, the acting leader of the CPI, suggested that the government maintained a feudal relationship with the Anglo-American bloc. Its need for economic aid, according to Mukherjee, distracted India from an 'independent foreign policy'. Non-alignment, he made clear in parliament, was nothing more than a 'smokescreen'.[53] At this time, India could hardly support an arms build-up sponsored by Russia. After all, the CPI (the second largest party in parliament) had members—such as Ajay Ghosh—who were known to popularize the views held by Soviet leaders such as Georgi Malenkov, the Russian 'Asianist'. Wary of the attempts by the likes of Ghosh to influence foreign policy, Nehru was clear that over-dependence on Russia for military hardware would weaken his ability to follow an independent path in international affairs.

In short, domestic interests and the need to maintain an internal political balance partially trumped the temptation to keep up with Pakistan's growing arsenal. Indeed, the CPI–Cominform association was a central point of discussion during N. S. Khrushchev and N. A. Bulganin's visit to India in 1955.[54] Nehru questioned how Indian communist leaders were allowed to enter the Soviet Union even

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[51] Cited in: 'US Military Aid to Pakistan', *The Hindu*, 24 December 1953.
[52] NMML, Eisenhower to Nehru, Washington, 25 February 1954, D. D. Eisenhower Papers.
[53] 'Bid to Exacerbate Indo-Pak Disputes', *Times of India*, 24 December 1953.
[54] NMML, Jawaharlal Nehru, 'Note by the Prime Minister on the visit of the Soviet leaders to India in November–December 1955', undated, Subimal Dutt Papers, Subject File No. 17.

though they lacked passports, and why the CPI felt it necessary 'to get directions from the Soviet Union'. Importantly, the issue of defence relations did not come-up once.[55] 'The visit', as Nehru later recorded, was 'an event of first class world importance'.[56] However, and for the time being, it was clear that domestic imperatives were primary for a nation unwilling to be drawn into an arms race, although not averse to an incremental arms build-up. Between 1955 and 1960, only two transport aircraft—IL-14 Crates—were provided to India without charge. Other platforms and equipment, as outlined in Table 10.3, were paid for—either in rupees or on favourable credit conditions. Importantly, Indian planners were aware that the equipment provided to Pakistan by the United States was qualitatively superior,[57] although the relative quantitative capabilities between the two sides were found to be close to 'matching'.[58]

The decision to import some equipment from Russia appears to have been prompted by Nehru's conviction that a degree of diversification was necessary,[59] and this need was the third factor restraining Indian arms expenditure. Much of India's arsenal was either left over following decolonization or bought from Britain,

Table 10.3. Soviet Military Transfers to India Between 1955 and 1965

Numbers ordered	Description	Delivered
8	An-12/Cub/Transport aircraft	1961
500	M-160 160mm/Mortar	1961–5
10	P-12/Spoon Rest/Air search radar	1961–70
10	P-15/Flat Face-A/Air search radar	1961–70
24	IL-14/Crate/Transport aircraft	1961–2
8	An-12/Cub/Transport aircraft	1962
95	M-43 120mm/Mortar	1963–4
36	Mi-4A/Hound-A/Helicopter	1962
10	MiG-21F/Fishbed-C/Fighter aircraft	1963–4
2	MiG-21F/Fishbed-D/Fighter aircraft	1964
178	PT-76/Light tank	1964–5
12	S-75 Dvina/SA-2/SAM system	1963–5
300	SA-2 Guideline/SAM	1963–5
25	An-12/Cub/Transport aircraft	1963–5
14	Mig-21F/Fishbed-C/Fighter aircraft	1965

Source: SIPRI Arms Transfer Database, accessible at: http://armstrade.sipri.org/armstrade/page/trade_register.php.

[55] NMML, 'Summary record of a talk between the Prime Minister of India and Mr. Bulganin and Mr. Khrushchev', 19 November 1955, Subimal Dutt papers, Subject File No. 82; NMML, 'Record of a further talk between the Prime Minister and Mr. N. A. Bulganin and Mr. N. S. Khrushchev held at the Prime Minister's house', 13 December 1955, *Ibid*.

[56] NMML, 'Note by the Prime Minister on the visit of the Soviet leaders to India in November–December 1955', Subimal Dutt papers, File No. 17.

[57] S. N. Prasad and U. P. Thapliyal, *The India-Pakistan War of 1965: A History* (New Delhi: Natraj Publishers, 2011), 7–14.

[58] Raju Thomas, *Indian Security Policy* (Princeton: Princeton Univ. Press, 1987), pp. 14–17.

[59] Nehru, Note to Commonwealth Secretariat, New Delhi, 12 November 1954, *SWJN* Vol. 27, p. 493.

which only transferred equipment to India and Pakistan on a commercial basis.[60] Also, given that the navy was mostly fitted with British platforms—India purchased HMS *Achilles* in 1948 and HMS *Nigeria* in 1954—the Defence Committee of the Cabinet thought it only prudent to equip the Indian Air Force with Soviet-made platforms.[61] Nehru made clear that such purchases—even though on favourable credit terms—were 'a purely business matter and had no political significance'.[62] The idea was to diversify the number of suppliers without dramatically increasing India's defence expenditure. We may take for instance the case of the MiG fighter aircraft finally procured from Russia. This purchase was not a decision taken lightly by the Indian administration; on the contrary, it occasioned serious debate in May and June of 1962.

The MiG decision was as much a matter of foreign as of defence policy, which explains why the foreign secretary—M. J. Desai—was at the centre of the decision-making process. Pressed by B. K. Nehru, the Indian Ambassador to the US, Desai made clear that the idea was to 'buy planes most suitable for our [Indian] defence needs and at lowest cost'. 'We', Desai continued, sought an arrangement whereby 'local manufacturers in India' could benefit, gradually reducing India's 'dependency on foreign supplies'. Crucially, the Indian Ministry of Defence (MoD) was looking for suppliers that could provide spare parts on a long-term basis. Spare parts for the Canberra aircraft purchased from the UK, were, according to Desai, proving to be 'a lot of trouble'.[63] In fact, as B. K. Nehru asked President Kennedy, 'what was the alternative' to the MiGs? Kennedy urged the younger Nehru to consider buying Lightnings from Britain, which India was hardly keen on. Offering American planes, Kennedy feared, 'would get him into immediate trouble with Pakistan'. On the whole, and although 'he was very worried about the proposed MiG deal', Kennedy accepted that there was little he could do.[64]

B. K. Nehru urged his uncle—the prime minister—to rethink an agreement with the Russians. There was an 'unbelievable amount of emotion,' he argued, 'attached to the MiG name. [...] Too many American boys had been killed by it in Korea.'[65] None the less, within India, as the prime minister made clear, there was 'widespread approval' in parliament for purchasing the MiGs. Air Force technicians too thought them a lot better 'suited' for India than were the proposed Lightnings.[66] It was not that the MiGs were a done deal. India even sent a technical team to Britain to test the Lightnings.[67] The MiGs, however, provided India with a degree of choice.

Importantly though, the MiGs would not reach India anytime soon—and were only finally delivered in the 1960s—whereas that the Lightnings would be delivered

[60] James, *Pakistan Chronicle*, 22–3.
[61] Nehru, Note to Secretary General, New Delhi, 10 November 1955, *SWJN*, Vol. 30, p. 351.
[62] Nehru, Note to Secretary General, New Delhi, 26 November 1955, *SWJN*, Vol. 31, p. 239.
[63] NMML, M. J. Desai to B. K. Nehru, New Delhi, 7 May 1962, B. K. Nehru Papers, Sub File No. 17.
[64] NMML, B. K. Nehru to Nehru, Washington, 14 June 1962, B. K. Nehru Papers, Sub File No. 17.
[65] NMML, B. K. Nehru to Nehru, Washington, 8 June 1962, *ibid*.
[66] NMML, Nehru to B. K. Nehru, New Delhi, 15 June 1962, *ibid*.
[67] NMML, M. J. Desai to B. K. Nehru, New Delhi, 27 July 1962, *ibid*.

sometime in the 1950s was highly probable, given India's close defence dealings with Britain following independence in 1947. Had the logic underlying action-reaction arms racing more generally played a part in Indian calculations, surely India would have looked to equip itself with whatever capabilities it could acquire as soon as possible. This consideration is especially potent, given that (as Table 10.2 shows) American-made Sabres had been delivered to Pakistan by 1958. Clearly, the desire for diversification and the need to avoid dependence placed brakes on the potential for racing. The disastrous impact of such decisions was fully revealed only following the outbreak of the 1962 Sino-Indian War.

WHY ARMS ALONE EXPLAIN LITTLE: THE ROAD TO WAR, 1962–1965

The Lost 'Window'

Following the war with China, Indian defence expenditure rose from 2 per cent or less of Gross National Product to 4.5 per cent. If calculated relative to GNP at current prices, India spent more on defence between 1963 and 1965—immediately after the war—than at any other time in the decade 1961–71 (see Table 10.4).

On average, as a percentage of GNP India and Pakistan spent roughly the same on defence between 1960 and 1970. India committed 3.4 per cent of its GNP to military expenditure and Pakistan committed 3.5 per cent during this decade. Even between 1963 and 1965—when Pakistan is said to have invested in a race for arms leading ostensibly to the outbreak of war, India outspent Pakistan by around a quarter of a per cent of its GNP.

In many ways, if arms races directly explained wars, Pakistan should have gone to war in the late 1950s or even in 1962–3—to coincide with the Chinese onslaught (see Tables 10.5 and 10.6). The so-called 'window of opportunity' was more

Table 10.4. Indian and Pakistani Defence Expenditures as a Percentage of GNP Between 1961 and 1970

Year	India	Pakistan
1961	2.1	2.5
1962	3.0	2.2
1963	4.5	3.2
1964	3.8	3.1
1965	4.1	5.3
1966	3.6	4.5
1967	3.3	3.6
1968	3.4	4.2
1969	3.3	3.8
1970	3.3	3.4

Source: K. Subrahmanyam, 'Indian Defence Expenditure in Global Perspective,' *Economic and Political Weekly*, 8/26 (1973), pp. 1155–8 and P. Terhal, 'Guns or Grains: Macro-Economic Costs of Indian Defence, 1960–70,' *Economic and Political Weekly*, 16/49 (1981), 1995–2004.

Table 10.5. (Select) 'Big Ticket' Indian Armaments Delivered Between 1959 and 1961

Type (and Total)	Suppliers and No. Delivered
Fighter Aircraft (792)	France: Mystère 4A- 110, UK: Vampire-FB 5- 333, UK: Gnat- 144, UK: Hunter- 182, UK: Sea Hawk FGA-6- 23
Bomber Aircraft (93)	UK: Canberra B (1) 8- 71, UK: Canberra B2- 22
Mortars (500)	USSR: M160/160mm- 500

Source: SIPRI Arms Transfer Database, accessible at: http://armstrade.sipri.org/armstrade/page/trade_register.php.

Table 10.6. (Select) 'Big Ticket' Pakistani Armaments Delivered Between 1959 and 1961

Type (and Total)	Suppliers and No. Delivered
Fighter Aircraft (126)	US: F-86F- 120, US: F104-A Starfighter- 6
Tanks (570)	US: M-47 Patton- 345, US: M36 Jackson- 25, M48 Patton- 200
Towed Guns (386)	US: M 115 203mm- 26, US: M 101 A1 105mm- 300, M 114 A1 155mm- 60

Source: SIPRI Arms Transfer Database, accessible at: http://armstrade.sipri.org/armstrade/page/trade_register.php.

evident in the late 1950s, especially given that—as demonstrated below—during that period Pakistan focused on importing land weapons critical for a war across the international border with India, whereas India focused more on air assets with an eye on China.

Further, between 1954 and 1960 the Eisenhower administration provided Pakistan with around $1.3 billion (at 1972 prices) worth of military assistance, defence support, and transfers on a concessionary basis. In comparison, India received less than $50 million worth in the same period.[68] The cost of India's direct military imports from all Western and communist countries between 1955 and 1956—at the same time as Pakistan was receiving large injections of US-made equipment and military financing following the Mutual Defence Pact in 1954— was only $134 million (at 1972 prices).[69] Apart from military assistance, 35 per cent of Pakistan's aid-dependent industrial and development expenditures for its first Five Year Plan (1955–60) were also financed by the US. If the momentum of an arms race is to be viewed as a cause of war, this would have been the most opportune moment for mobilization.

In contrast, by 1965—and as indicated above—India was able to diversify her import sources whilst increasing her expenditure on military imports considerably when compared to the pre-1962–3 period. By 1965, leaving aside the UK and Russia, India was able to import goods from Canada, Israel (one order for 200 mortars), the Netherlands, and Poland. India's multination procurement targets had been realized (in terms of deliveries) by the end of 1964 and certainly by the

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[68] Stephen P/Cohen, 'US Weapons and South Asia: a Policy Analysis' *Pacific Affairs* 49/1 (1976), 49–69.
[69] Terhal, 'Guns or Grains', 1997.

beginning of 1965. In fact, by 1965, deliveries to India included the sort of land-based equipment that it had lacked in the late 1950s and early 1960s. This included 100 Soviet-built T-54 tanks—the first major delivery of T-class tanks to India—ninety Vijayanta Tanks (produced in India in collaboration with British firms), and close to 600 Soviet-supplied mortars. Between 1962 and 1965, the USSR delivered twenty-seven types of items—including air-search radars, towed guns, bombers, fighter aircraft, tanks, SAMs, and helicopters—compared to only six types of items between 1957 and 1961.[70] With such capabilities in hand, and given Soviet commitments to India, it could well be argued that the 'window of opportunity' for Pakistan had in fact closed by 1965. Hence, rather than the injection of arms into India following the 1962 War—and the associated Pakistani anxieties and reactions with regard to the same—more plausible explanations for the outbreak of war can be found in at least two other factors. The first was the failure of attempts to find a solution to the Kashmir dispute between 1962 and 1963. The second was a false sense of hubris within Pakistan following a modest border skirmish in April 1965 that finally led to a war Pakistan did not want.

Failure of Kashmir Talks

On 16 October, four days prior to the first serious Chinese attack on Indian posts in what was then called the North East Frontier Agency (NEFA)—present-day Arunachal Pradesh in India—Pakistani Prime Minister M. Ali made a plea to his American interlocutors. In a carefully crafted note, Ali told Dean Rusk—the US Secretary of State—that American arms deliveries to India were both embarrassing to Pakistan—an ally of the US—and deeply troubling to its military. India, Ali argued, was simply getting a 'free ride'. This was the moment to push India to engage in 'ministerial level discussions on outstanding Indo-Pak issues'.[71] Pakistani demands grew firmer as the border war with China drew to an end. By the end of November, or soon after the Chinese called a unilateral ceasefire on 21 November, both Kennedy and British Prime Minister Harold Macmillan were convinced that continuing to arm India would be impossible without convincing Nehru to discuss Kashmir with Pakistan. This, they thought, was what it would take to keep Pakistan onside. In fact, at this point there was very little to suggest that either arms sales to India or the need for a settlement would lead Pakistani elites to consider a military solution. Diplomacy and Western pressure on India, it was assumed, would suffice to push Nehru and his envoys into some form of compromise solution—such as dividing the Kashmir Valley—which Pakistan might find acceptable.[72] Interestingly, in a series of exchanges between Pakistani and American officials there is nothing to suggest that US arms deliveries to India pushed Ayub into asking for further

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[70] The narrative here is based on an analysis of Indian and Pakistani arms imports and transfer, available at: SIPRI Arms Transfer Database, accessible at: http://armstrade.sipri.org/armstrade/page/trade_register.php.

[71] State to Embassy in Pakistan, 16 October 1962, *FRUS South Asia* Volume XII (Washington, 1996), p. 345.

[72] For a background *see* McMahon, *The Cold War on the Periphery*, 130–60.

arms. The idea at the time was to use the West's assumed diplomatic leverage in order to conclude a deal on Kashmir.

Between December 1962 and May 1963 India and Pakistan conducted six rounds of talks about Kashmir and related topics. As far as the Indian government was concerned it had little option but to entertain Anglo-American diplomatic demands. India's defence needs—to be serviced by the West—were pressing, to say the least. The number of men in the army needed to be increased by 50 per cent. Unlike Pakistan's better-serviced Patton tanks, 312 of India's Sherman tanks desperately needed repair and maintenance, and in all 40,000 military vehicles were inoperative. Indigenous production could only meet 15 per cent of India's ammunition needs to service its sixteen divisions. As one official put it, 'an atmosphere of complete unreality prevailed'.[73]

With these imperatives in mind, Nehru's envoys discussed the future of Kashmir and other related issues with their Pakistani counterparts. In the first three rounds—held in Rawalpindi, Delhi, and Karachi—there was some hope of a settlement. At one point, a young Zulkifar Ali Bhutto (leading Pakistan's delegation) thought that India might be pushed to accept a minimalist plan that left more of the Valley under the control of Pakistan than before. Ayub spent most of his time in conversation with American interlocutors assessing the West's continued desire to pressure Nehru. By the end of the last round (on 16 May), however, it was clear that a settlement in any shape or form was impossible. Kennedy buckled, allowing the US to go ahead with arms transfers to India—with or without British and Commonwealth approval. As far as Kennedy was concerned, it was simply not worth being 'penny wise about India'.[74] Apart from the 'big ticket' items transferred to India—outlined in Table 10.5—the Americans helped India equip two new army corps, build roads, provide ground control radios and radars, and modernize two mountain divisions.[75] As far as Ayub was concerned, the failure of the attempted diplomatic breakthrough was disheartening to say the least. He now considered covert military plans to incite rebellion within Jammu and Kashmir.

Interestingly, it was not until 1965 that Pakistan dramatically increased its expenditure for the procurement of military hardware. In fact, Ayub was under the impression that following the war with China, India had armed itself—with Western assistance—to a level far beyond its 'legitimate requirement'. Further, the Pakistani president argued that India had become part and parcel of an American-led alliance system whereby India had direct access to Western hardware. A few days before the border skirmish in April 1965, in a meeting with Soviet Premier Alexei Kosygin, Ayub forcefully stated that 'only a blind person would call India non-aligned'. India, according to Ayub, was intricately connected to America's military-industrial complex. Kosygin argued that the dispute over Kashmir

[73] NMML, T. T. Krishnamachari to Nehru, 26 December 1962, correspondence with Nehru, TTK Papers.
[74] State to Karachi, 24 April 1963, *FRUS*, Volume XII, p. 556.
[75] For details see: Rudra Chaudhuri, *Forged in Crisis: India and the United States since 1947* (New York, 2014), 146–7.

remained the central cause for Indian and Pakistani conflict, although the arms deliveries to India after 1962 had led the Pakistani president to believe that a military-led solution was impracticable. India was simply too strong.[76] The next section shows how and why a covert operation was therefore contemplated and executed, following a modest exchange of arms that deluded the Pakistani military into thinking that after 1962 the Indian Army's morale had been all but lost.

A Skirmish, Hubris, and War

On 1 July 1965, a ceasefire was officially announced by the leadership in India and Pakistan. The terms of the ceasefire had been negotiated by British Prime Minister Harold Wilson. It ended a skirmish—started on 9 April 1965—between Pakistani and Indian forces in an area known as the Rann of Kutch. The Rann was disputed territory. Whilst it lay in the Indian state of Gujarat, Pakistan claimed a part belonged to its province of Sindh.[77] Indeed, by the time the last shots were fired on 26 April, the Indian Army had retreated from most of its posts. The Pakistani military establishment was in a 'state of euphoria', as the then Pakistani Information Secretary put it. The Director of Military Operations argued that his 'high command' was 'intoxicated' by the army's showing. 'We,' he asserted, 'were [are?] ready for any task that may be assigned to us and without any question.'[78]

Ayub, however, well understood that war with India would put 'Pakistan's survival at risk'. Instead, he was led to believe that a limited covert operation in Kashmir could provide the spark to ignite the tinder for revolt. Zulfikar Ali Bhutto—Ayub's Foreign Minister—also suggested that Kashmir was ripe for rebellion: 'A popular revolt', Bhutto argued, 'would follow immediately.'[79]

Accordingly, 2,000–3,000 Pakistani regulars and irregulars crossed over into Jammu and Kashmir to launch Operation Gibraltar in August 1965. The plan failed. Ordinary Kashmiris were neither prepared to revolt nor willing to assist Pakistan in its plans for annexation. As the new Indian Prime Minister Lal Bahadur Shastri put it to the US Ambassador in New Delhi, the entire operation was premised on a 'false assumption'.[80] Astonishingly, Ayub—who temporarily moved to Swat, the Pakistani district in the North West of the country—was not even informed that Gibraltar had failed. He signed an order to launch what was called Operation Grand Slam—the next phase of direct Pakistani action—with no intelligence about the attempt at revolt.[81] The idea was to occupy the town of Akhnoor on the Indian side of the border and cut-off all lines of communication between Jammu and Kashmir and the Indian mainland. This was still designed as a limited operation. However, Indian forces under General J. N. Chaudhuri responded by

[76] M. A. Khan, *Friends Not Masters: A Political Biography* (London, 1967), 122–4; and A. Gauhar, *Ayub Khan: Pakistan's First Military Ruler* (London, 1996), 190–1.

[77] For a background see: Farooq Bajwa, *From Kutch to Tashkent: The Indo-Pakistan War of 1965* (London, 2013), chapter 3.

[78] Quoted in Gauhar, *Ayub Khan*, 200–3.   [79] *Ibid.*

[80] Chester Bowles to State, New Delhi, 4 September 1965, *FRUS* Volume XXV, pp. 350–2.

[81] Gauhar, *Ayub Khan*, 223.

opening a second front along the International Border to relieve the frontal attacks on Akhnoor, and in and around Jammu more generally. In short, Indian mobilization—starting on 6 September—came as a complete shock to Pakistan and Ayub. That Pakistan had neither wanted nor expected an all-out war was clear. The army's ammunition dumps on the border could support its divisions for only a day or two.[82] By the third week of September, and with Indian forces within range of Lahore International Airport, the UN called for a ceasefire that was in turn supported by a British- and American-backed arms embargo on India and Pakistan. A negotiated settlement in Tashkent in January 1966 led both armies to return to their positions prior to August 1965 when Operation Gibraltar was initiated.

What this summary demonstrates is that assumptions about low morale within India and miscalculations with regards to Indian reactions—such as opening a second front—led to an outbreak of war that was wholly unexpected and unwanted within Pakistan. When India opened the second front, commented the president's close advisor Altaf Gauhar, 'the most surprised person was Ayub Khan'.[83] The 'mistaken euphoria', argues one historian and Pakistan watcher, following the incidents on the Rann of Kutch led to a war that few could have even conceived.[84] In short, self-delusion, intelligence failure, and complete misunderstanding of likely Indian reactions led to a war no one had wanted or envisaged.

CONCLUSION

This chapter makes a simple but perhaps cogent point: the very notion of an arms race as popularized in a whole body of Anglo-American writings is less relevant with regard to South Asia. During the first fifteen years of Indian and Pakistani independence the dynamics underlying a race to war were mitigated by two factors, given that both states lacked a robust and effective military-industrial complex of their own. First, internal political considerations affected the way in which states designed their procurement practices and determined their needs for military assistance from abroad. This became clear following the US–Pakistan Mutual Defence Pact in 1954 and from Nehru's need to balance Soviet and American influence. Second, even the military regime in Pakistan sought diplomatic solutions aided by third parties to regional disputes such as Kashmir, rather than an uncontrolled armaments build-up that would have made escalation and war more likely. Military competition alone—as witnessed between 1954 and 1965—did not necessarily lead to an all-out armaments race. Even when diplomatic initiatives failed, as between 1962 and 1963, and even when India was acquiring a super arsenal, it

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[82] For a brief recount see: Farooq Bajwa, *From Kutch to Tashkent: the Indo-Pakistan War of 1965* (London, 2013), 251–313 and S. N. Prasad and U. P. Thapliyal, *The India-Pakistan War of 1965: A History* (New Delhi, 2011), 87–185.

[83] *Ibid.*

[84] Cited in Ishtiaq Ahmed, *Pakistan: The Garrison State: Origins, Evolution, Consequences, 1947–2011* (London, 2013), 135.

does not seem that armaments developments in this period contributed to the outbreak of war.

In fact, and as much more clearly evidenced in the still growing body of work on the diplomatic history of South Asia suggests, the idea that military competition alone has ever led to a war between India and Pakistan remains unsubstantiated. In fact, recent scholarship on the two wars since 1965—that is the 1971 war, which in turn led to the creation of Bangladesh, and the limited war in Kashmir in 1999—makes clear that racing itself explains little. In the case of 1971, there is almost no doubt that war broke out as a result of the internal crisis in East Pakistan, the high rates of East Pakistani migration into India's less stable border regions in the North East, and finally Indian Prime Minister Indira Gandhi's determination to put an end to a crisis that threatened the demographic make-up of India's border cities alongside East Pakistan.[85] In 1999, a limited conflict in Kashmir was caused primarily because of a gamble taken by then Pakistani Chief of Army Staff General Pervez Musharraf. The idea was to infiltrate, occupy and hold Indian positions along the Line of Control (LoC) dividing Indian- and Pakistani-administered Kashmir. Once again, the idea, as it later transpired, was to force the hand of the United States and the international community more generally so as to find a solution to the Kashmir dispute. The plan, much like in 1965, failed. Once again, and as Musharraf's autobiography makes clear, the outbreak of war had a lot more to do with the still unresolved dispute over Kashmir than with the dynamics underscoring military competition.[86]

The war in 1999 was the first—and to date the only one in the region—conducted under a nuclear umbrella. Indeed, since India and Pakistan tested nuclear weapons in May 1998, much academic scholarship has focused on whether a nuclear arms race is underway in South Asia.[87] The modernization of long-range delivery systems, ever increasing fissile material stocks, and allegations that Pakistan is intent on building an arsenal of tactical nuclear weapons, have pushed the debate on arms races in the current milieu from a focus on the conventional military balance to a focus on the nuclear balance.[88] Yet, and as this chapter has demonstrated, in South Asia assumptions and speculation around conventional arms racing are largely unsubstantiated. Similarly, whether or not India and Pakistan are really engaged in a nuclear arms race requires further examination. Indeed, as this chapter has shown, competition does not always lead to a race. In fact, as scholars and regional experts themselves suggest, Pakistan might be found competing with India whereas the latter competes with China.[89] Hence, whether it is to do with the conventional or with the nuclear military balance, there is an urgent need for scholarly investigation both into the past and into the somewhat duller business of defence eco-

[85] Srinath Raghavan, *1971: A Global History of the Creation of Bangladesh* (London, 2013), 1–34, 184–235; Gary J. Bass, *The Blood Telegram: India's Secret War in East Pakistan* (New Delhi, 2013), 3–36, 258–89.

[86] Pervez Musharraf, *In the Line of Fire: A Memoir* (London, 2006), 87–108.

[87] For a review see V. Narang, *Nuclear Strategy In The Modern Era: Regional Powers and International Conflict* (Princeton, 2014), 55–121.

[88] 'India-Pakistan: An Ineluctable Arms Race', *Non-Proliferation Monthly* 73 (2012), 5.

[89] Dalton and Tandler, 'Understanding the Arms "Race" in South Asia', 4.

nomics in the present. This is a body of work that needs to be created, in order to provide both empirical and conceptual clarity to questions that Anglo-American writings have examined in far greater depth. The credible work on the political economy of defence in both India and Pakistan can be placed on a shelf no longer than a ten-inch ruler. This chapter has sought to interrogate the debate around arms races and to outline an agenda for further historical study. The key objective has been to test the thesis concerning so-called 'windows of opportunity' and explain why such reasoning is less relevant to the outbreak of South Asia wars—such as in 1965—than is commonly assumed. The chapter is far from exhaustive in its design and approach, but is intended to expand on a body of work and historiography that remains woefully underdeveloped.

ACKNOWLEDGEMENTS

RUSSIA

KAZAKHSTAN

MONGOLIA

Sea of Japan

NORTH
KOREA

SOUTH
KOREA

JAPAN

Kunsan

Sasebo

Yellow Sea

P A C I F I C

O C E A N

PAKISTAN

CHINA

East China Sea

Okinawa

NEPAL

BHUTAN

Second Island Chain

BANGLADESH

TAIWAN

First Island Chain

I N D I A

BURMA

LAOS

South China Sea

Philippine Sea

Guam

Bay of Bengal

THAILAND

VIETNAM

CAMBODIA

PHILIPPINES

SRI
LANKA

BRUNEI

Celebes Sea

PAPUA
NEW GUINEA

MALAYSIA

SINGAPORE

I N D O N E S I A

Coral Sea

I N D I A N
O C E A N

Australia

Map 6. Asia

11

Racing from Behind

China and the Dynamics of Arms Chases and Races in East Asia in the Twenty-First Century

Tai Ming Cheung

INTRODUCTION

Is a major arms race brewing or already underway in East Asia that pits China against the United States and other Asian states? If the intensifying armament drives that are taking place across the region, especially by big powers such as China, India, and Japan, are being driven by action-reaction dynamics, what are the implications for regional security, especially the potential for war?

There is wide-ranging debate as to whether East Asia today is in the throes of an arms race or less intense forms of arms competition.[1] There has been speculation since the end of the Cold War that East Asia, and especially the contest between the US and China, would replace US–Soviet strategic competition as the principal arena for great power military rivalry. The region was, as one scholar suggested, 'ripe for rivalry'.[2] While the 1990s and 2000s witnessed a number of Asian countries undertake concerted efforts to build up their military power, much of the focus was on incremental modernization to improve defensive capabilities rather than in reaction to military moves by potential foes.

Since the late 2000s though, there have been emerging signs that China is moving beyond this routine or enhanced military modernization and embarking on a more action-reaction arms acquisitions process as well as pursuing capabilities that have more offensive characteristics at a regional or perhaps even at a global level. Aircraft carriers, long-range ballistic missiles, and submarines are just some of these weapons systems with power-projection capabilities that China is putting

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[1] For examples of this debate, *see* Richard A. Bitzinger, 'A New Arms Race?: Explaining Recent Southeast Asian Military Acquisitions', *Contemporary Southeast Asia* 32/1 (2010), 50–69; Desmond Ball, 'Arms Modernization in Asia: An Emerging Complex Arms Race', in Andrew T. H. Tan, ed., *The Global Arms Trade: A Handbook* (Routledge, 2010), 30–51; Henry D. Sokolski, *The Next Arms Race* (Carlisle, PA: Army War College, 2012); Geoffrey Tilley, 'What Arms Race? Why Asia Isn't Europe 1913', *The Diplomat*, 15 February 2013; Joachim Hofbauer and Guy Ben-Ari, 'Not an Arms Race: Parsing Asia's Defence Spending', *World Politics Review*, 7 November 2012; Christian Le Mière, 'The Spectre of an Asian Arms Race', *Survival* 56/1 (2014), 139–56.

[2] Aaron L. Friedberg, 'Ripe for Rivalry: Prospects for Peace in a Multipolar Asia', *International Security* 18/3 (1993–94), 5–53.

into service or actively developing. As a consequence, other regional neighbours in East, South East, and South Asia are also having to step up the pace and scale of their modernization efforts in response to China's moves.

This chapter examines the nature and drivers of the modernization process that the People's Liberation Army (PLA) has been undertaking since the beginning of its reform and open-door policy at the end of the 1970s, and especially over the past twenty-five years, through the analytical framework of whether it constitutes an arms race or not. We begin by offering a typology of six different categories of arms building from routine modernization at one end of the spectrum to major arms races at the other end. This is followed by a discussion of three distinct stages in China's defence modernization over the past thirty-five years, beginning with routine modernization in the 1980s, followed by enhanced modernization coupled with localized arms racing between the 1990s and late 2000s. The third and latest phase began in the late 2000s and is characterized by regional arms racing.

The nature and drivers of China's arms racing/chasing interactions with the US, which is its perceived primary long-term competitor, are then examined in detail. Of particular interest is whether and to what extent Chinese policy makers and planners see the US as becoming a direct military rival and what this means for Chinese responses. Special attention will be given to the US bombing of the Chinese embassy in Belgrade in 1999, which had an especially profound impact on Chinese leadership thinking on strategic arms competition with the US. Attention then turns to considering the role played by domestic Chinese dynamics, especially the growing voices of the PLA and defence industrial complex in national security policy-making. The chapter concludes by discussing the implications of China's military building on regional peace and security.

A TYPOLOGY OF ARMS BUILDING DYNAMICS IN CHINA AND EAST ASIA IN THE TWENTY-FIRST CENTURY

The military-security landscape in East Asia in the early twenty-first century is distinguished by a complex set of competing and intersecting security dynamics at different levels of the regional order. This ranges from localized hotspots on the Korean Peninsula and the Taiwan Strait to overarching region-wide developments such as China's military rise, the US rebalancing back to the Asia–Pacific, intensifying maritime disputes, and deepening security competition among the region's great powers. In response, states across the Asia–Pacific region are beefing up their military capabilities either through acquisitions or redeploying existing forces from elsewhere in the world, such as with the US.

To understand the nature and nuances of the diverse dynamics shaping the military building that is taking place across the region, it would be useful to classify the different patterns of arms building taking place and seek to determine their underlying causes. While many of the classic forms of arms modernization and

arms-racing behaviour can be seen in the activities of East Asian states, there are also features that are not typically found or not as prominently as in other regions and time-periods.

A distinctive feature is the wide gulf in military capabilities and technology levels between the US and China. This means that the efforts by China to build up its military capabilities against the US are better described as 'chasing' rather than 'racing'. In this situation, if one state is chasing to catch up while the other is so far ahead that it does not need to respond in kind, does the absence of comparable action-reaction dynamics mean that this relationship cannot be considered to be an arms race? Or is it a case of racing from behind, which means that it is still arms racing because it has many other important attributes?

In assessing the nature and drivers of China's military development, six levels of arms building behaviour have been identified that will be used to classify the Chinese activity. These categories are not mutually exclusive and can overlap:

- **Routine modernization:** Limited incremental modernization aimed at ensuring that military capabilities are kept up-to-date with the latest international standards without being directed towards any one rival.

- **Enhanced modernization:** Arms competition with another state or states, but the emphasis is on maintaining the status quo rather than seeking military dominance. This is what Barry Buzan and Eric Herring describes as the 'arms dynamic' or what Richard Bitzinger calls as modernization plus.[3] The primary focus is on the development of defensive capabilities.

- **Localized arms racing**: Intensive quantitative and/or qualitative escalatory competition in arms acquisitions between two or more rival states that are directing their defence strategies and postures against each other but is limited and localized in geographical or functional scope. While some offensive capabilities and drivers are at play, the overall focus remains defensive in nature.

- **Regional arms racing**: Intensive quantitative and/or qualitative escalatory competition in arms acquisitions between two or more rival states that are directing their defence strategies and postures against each other at the regional level and in different domains. Acquisition is of both defensive and offensive capabilities.

- **Regional arms chasing**: Intensive quantitative and/or qualitative arms acquisitions by one state to catch up with a superior rival. Acquisition is of both defensive and offensive capabilities.

- **Major arms racing**: Intensive quantitative and/or qualitative escalatory competition in arms acquisitions between two or more rival states that are directing their defence strategies and postures against each other at a global level. A primary focus is on the acquisition of offensive capabilities for power projection.

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[3] Barry Buzan and Eric Herring, *The Arms Dynamic in World Politics* (London, 1998); Bitzinger, 'A New Arms Race?'
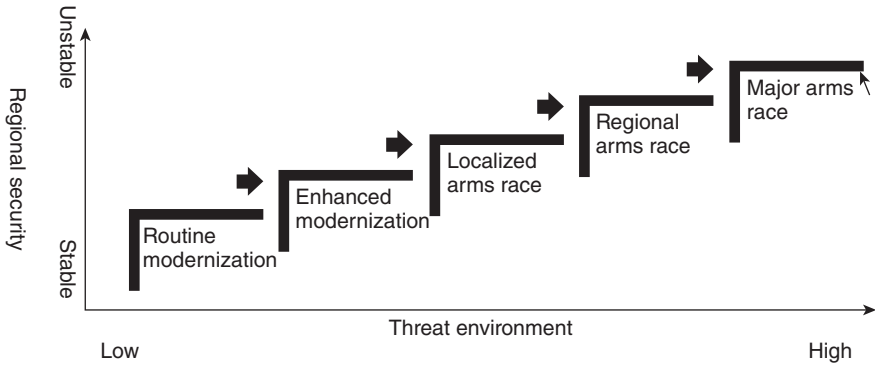
Figure 11.1. Types of Arms Modernization and Arms Races in East Asia in the Twenty-First Century

FROM ROUTINE MODERNIZATION TO ESCALATING LEVELS OF ARMS RACING AND CHASING: THE EVOLVING NATURE OF CHINA'S MILITARY DEVELOPMENT SINCE THE 1980s

China's military development since the 1980s (see Table 11.1) can be divided into three periods: 1) routine modernization during the 1980s; 2) enhanced modernization overlapping with elements of localized arms racing from the early 1990s to the late 2000s; and 3) the emergence of regional arms racing from the late 2000s.

Routine Modernization in the 1980s

Defence modernization during the 1980s was piecemeal and lacklustre with limited resources and lukewarm leadership support. The central priority during this period was on economic development. This required a concerted effort to de-militarize a country that had been on a near-permanent war footing between the 1950s and 1970s and to foster a peaceful external security environment to allow for a far-reaching retrenchment in military forces and capabilities. China made extensive efforts to improve relations with former arch-foes such as the US, the Soviet Union, and even Taiwan.

The modest military modernization that did take place during this ten-year period of declining budgets was on selective replacement of obsolete weapons with new equipment that was defensive in nature. This gave the PLA very little capacity to project its power beyond its land borders.

Table 11.1. The Evolving Nature of China's Military Development Since the 1980s

Period	1980s	1990s-Late 2000s	Late 2000s to Present
Modernization/Arms Race Type	Routine Modernization	Localized Arms Racing (China-Taiwan) and Enhanced Modernization (Rest of PLA)	Regional Arms Racing (China-US, China-Japan, China-India) and Arms Chasing (China-US)
Areas of Arms Racing	None	Ballistic Missiles, Cyber, Aviation	Space, Cyber, Ballistic Missiles, Submarines
Defensive vs. Offensive	Defensive	Defensive, With Elements of Offensive	Offensive, With Elements of Defensive
Modernizing, Racing, Chasing Against Who?	Capacity-Based Modernization (Non-Threat Specific)	Taiwan, US	US, Taiwan, Japan, India
Pace of Modernization/Arms Racing	Incremental	Moderate/Rapid	Moderate/Rapid
Military Doctrine	People's War Under Modern Conditions	Local War Under High-Technology Conditions	Local War Under Informatized Conditions
Principal Strategic Threat/Nature of Arms Racing Dynamic	Soviet Union/No Arms Racing	Taiwan/Conventional and Asymmetric Arms Racing	US/Asymmetric Arms Racing
Qualitative vs. Quantitative Modernization/Arms Racing	Qualitative	Qualitative and Quantitative	Qualitative
Force Posture	Non-Threatening, Defensive	Offensive in Taiwan Strait, Defensive Elsewhere	Forward Defence to First Island Chain

Enhanced Modernization with Pockets of Localized
Arms Racing in the 1990s and 2000s

The nature of China's defence modernization efforts began to shift from the beginning of the 1990s as a result of far-reaching changes in the international and domestic environments. First, the Communist Party became deeply indebted to the PLA for its intervention in cracking down against civilian protesters in Beijing in June 1989, and one of the rewards was large increases in defence budgets in subsequent years. A second factor was the lessons that Chinese military chiefs learnt from the outcome of the 1991 Persian Gulf War, in which the overwhelming technological superiority of the US and its coalition allies dealt a crushing blow to Iraq, whose approach to warfare bore close similarities with Chinese principles. The Gulf War finally forced the PLA to overcome its long-standing Maoist-inherited aversion to technology and embrace the central role of high technology. These drivers led the PLA to begin to adopt a more enhanced programme of defence modernization, especially during the 9th and 10th Five Year Defence Programs from 1996 to 2005.

A third factor that appeared from the early 1990s, and which had a far-reaching and long-term impact on China's military modernization efforts, was the likelihood that Taiwan might break away from China and declare independence. Between the early 1990s and the late 2000s, Taiwanese presidents Lee Tung-hui and Chen Shui-bian shifted the island's grand strategy away from reunification with the mainland and towards greater international recognition of Taiwan's de facto independent statehood. This led to severe tensions and volatility in relations with Beijing, which included aggressive shows of military force by the PLA in 1995–6 and an accelerating build-up of offensive Chinese military capabilities in eastern coastal provinces adjacent to Taiwan.

The central objective of this localized arms racing was to acquire the capabilities that would allow the PLA to execute a quick and decisive victory against Taiwanese forces while deterring US military intervention. The PLA's concentrated acquisition of precision-strike assets indicates that its preferred military strategy would be a 'decapitation' strategy that would neutralize Taiwan's civilian and military command-and-control apparatuses, vital infrastructure, and communication facilities, in addition to key military capabilities.

The centrepiece of this build-up was offensive ballistic-missile capabilities. A concerted expansion of the PLA's short-range ballistic-missile (SRBM) forces across from Taiwan began in the mid-1990s. The US Defense Department estimates that the PLA had deployed between 1,000 and 1,200 SRBM to units opposite Taiwan by late 2011, which could be used against targets not only in Taiwan but also Okinawa and Guam.[4] In addition, new models of intercontinental ballistic missiles (ICBM) also began entering service from the mid to late 2000s. Moreover, the PLA also began acquiring large numbers of highly accurate

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[4] *Military and Security Developments Involving the People's Republic of China 2012* (Washington D.C., 2012), 21.

land-, air-, and sea-launched cruise missiles, such as the DH-10 and the Russian SS-N-22 Sunburn.

Another purpose for these missile capabilities, as well as the rapid build-up of the PLA Navy's submarine force, is to develop robust anti-access/area-denial (A2/AD) capabilities to deter the US and allies from intervening in the Taiwan Strait, blockade Taiwan, and overwhelm the Taiwanese Navy.

This localized arms racing appeared intended to allow the PLA to gain the upper hand in the Cross-Strait military balance by the beginning of the 2010s. A key strategic goal for the PLA in acquiring this military superiority would be to carry out a successful invasion and conquest of Taiwan if ordered by the civilian authorities. The US Defense Department, though, does not believe that the PLA is able to carry out this objective anytime soon. Throughout the 2000s and into the early 2010s, the Pentagon's assessment was that the PLA could conduct various limited military operations against Taiwan short of a full-scale invasion. The Pentagon's 2015 China report assesses that the PLA now has the capabilities 'to attempt an invasion'.[5]

The cumulative impact of this sustained effort has been a significant enhancement in the PLA's state of preparedness and war-fighting capabilities, especially in areas such as amphibious warfare, ballistic-missile forces, and information-based operations directed towards Taiwan. PLA forces in the Nanjing, Guangzhou, and Jinan Military Regions, which are directly responsible for Cross-Strait operations, have, in particular, enjoyed priority access to the infusion of new capabilities, and have stepped up their training and operational preparations. They are among the best-equipped and intensively trained pockets of excellence in a sprawling 2.5 million-strong military establishment, where a majority of front-line equipment remains outdated and many units, especially ground forces, located away from the country's strategic coastal provinces, and at lower rates of readiness.[6]

The Emergence of Regional Arms Racing and Chasing Since the Late 2000s

Building upon the enhanced modernization-localized arms-racing pattern in China's force development, the PLA appears to have stepped up its level of military transformation in the late 2000s to what might be more accurately described as a regional arms chasing/racing dynamic. This shift towards a more regional focus, especially for the PLA's air, naval, and strategic missile forces, began as the Chinese threat calculus moved beyond Taiwan—which still remained critically important in PLA thinking—to more attention being devoted to the US forward defence

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[5] *Military and Security Developments Involving the People's Republic of China 2015* (Washington D.C., 2015), 57.

[6] In 2011, the US Defense Department assessed that around 25–28 per cent of the front-line inventory of the PLA's naval surface forces and air force was composed of 'modern' equipment. For warships, this was defined as 'multi-mission platforms with significant capabilities in at least two warfare areas'. For the air force, modern was defined as '4th generation platforms (Su-27, Su-30, F-10) and platforms with 4th generation-like capabilities (FB-7)'. *Military and Security Developments Involving the People's Republic of China 2011* (Washington D.C., 2011), 43.

presence in the Asia–Pacific region and increasing emphasis on maritime matters along with growing attention to the space and cyber domains. A sharp deterioration in China–Japan relations since the early 2010s has further contributed to this regional arms racing. Furthermore, there also appear to be emerging signs of an arms-race dynamic between China and India.

At the centre of the regional arms-chasing/racing dynamic is China's development of a wide assortment of asymmetric military capabilities and strategies to interfere with the ability of the US to deploy or operate its military forces in East Asia, especially in the maritime regime.[7] The original intention of what the Chinese refer to as a counter-intervention strategy was to deter the US and other parties from stepping in to oppose any Chinese military actions over Taiwan, but the development of capabilities has steadily expanded beyond Taiwan to the Western Pacific or what the Chinese term as the second island chain. A major rationale for this orientation in focus towards the US was the US bombing of the Chinese embassy in Belgrade in 1999, which will be discussed later in this chapter.

Work has focused on anti-access, area-denial capabilities that include submarines and highly accurate anti-ship ballistic missiles, along with research and development of anti-satellite assets that include kinetic and non-kinetic forms. The successful deployment of anti-ship ballistic missiles such as the 1,500km-range DF-21D could, according to some analysts, 'alter the rules in the Pacific and place US Navy carrier strike groups in jeopardy'.[8]

This asymmetric arms-chasing/racing dynamic has also expanded from the conventional military arena into the information-warfare and space domains. These are two areas that have received prominent attention from the Chinese authorities. In his keynote speech at the 18th Communist Party Congress in 2012 discussing national defence priorities, Hu Jintao pointed out that 'great importance' should be attached to 'space and cyberspace security'.[9]

China's military-related space programme is extensive and ranges from the establishment of an extensive network of reconnaissance and communications satellites to manned space, lunar exploration, and ASAT programmes. This was highlighted by a Chinese direct ascent anti-satellite test in January 2007, when the PLA used a modified ballistic missile to shoot down one of its own satellites. In addition, there are major research and development programmes in ASAT-related lasers, high-powered microwave, particle-beam weapons, and near-space hypersonic vehicles.

Information warfare is another high priority development area for the PLA, defence industry, and a burgeoning information security sector, especially in areas

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[7] *See* Roger Cliff, Mark Burles, Michael S. Chase, Derek Eaton, and Kevin L. Pollpeter, *Entering the Dragon's Lair: Chinese Anti-Access Strategies and Their Implications for the United States* (Santa Monica, 2007).

[8] Andrew S. Erickson and David D. Yang, 'On the Verge of a Game-Changer', *Proceedings Magazine*, May 2009. Other analysts though downplay the game-changing potential of the DF-21D and suggest that the US has developed effective counter-measures. *See* Ronald O'Rourke, *China Naval Modernization: Implications for U.S. Navy Capabilities* (Washington D.C., 2013).

[9] Hu Jintao, *Report to the Eighteenth National Congress of the Communist Party of China*, 8 November 2012.

such as electronic countermeasures and computer network operations, which includes computer-network attack, computer-network exploitation, and computer-network defence. The PLA has been building an extensive infrastructure to conduct such operations.[10] Rapidly intensifying levels of cyber-espionage by organizations and individuals in China, many of which can be traced to PLA-affiliated entities, has become a major source of friction in relations between China and the US and numerous other advanced industrial countries.[11] The race in the development of cyber-defensive and offensive capabilities by China, the US, and other countries has many of the attributes of an arms race, although whether it constitutes warfare is another question.

Securing China's regional and increasingly global maritime interests has also risen to the top of national security priorities in the past few years. In his 18th Party Congress address, Hu Jintao called for the 'resolute safeguarding of China's maritime rights and interests' and to 'build China into a maritime power'.[12] Hu's call to arms came as China became entangled in an escalating territorial dispute with Japan over the Diaoyu or Senkaku Islands in the East China Sea, as well as over competing sovereignty claims for the Spratly Islands in the South China Sea. Added to this are concerns over the security of sea-lanes through which nearly 90 per cent of China's trade flows, and development of maritime resources in the seas around China.

This has led to a major expansion in China's naval capabilities over the past ten to fifteen years, especially in submarines, naval air-strike capabilities, and, most recently, a rudimentary aircraft-carrier capability. According to the US Navy's Office of Naval Intelligence (ONI), much of the improvement since 2000 has been in the modernization of technological capabilities, while the overall numbers of vessels have increased modestly.[13] For the PLA Navy's submarine force (diesel and nuclear attack and ballistic), the total number of vessels actually decreased from 66 in 2000 to 63 in 2010 because of the retirement of large numbers of obsolete submarines, but is forecast to grow to between sixty-nine and seventy-eight vessels by 2020. The percentage of vessels estimated by ONI to be 'modern' (defined as able to employ submarine-launched intercontinental ballistic missiles or anti-ship cruise missiles) grew from 7 per cent in 2000 to more than 40 per cent in 2010 and is forecast to reach around 90 per cent by 2020. For surface warships, which include aircraft carriers, destroyers, frigates, corvettes, amphibious ships, and

[10] *See* Mark A. Stokes, Jenny Lin and L. C. Russell Hsiao, *Chinese People's Liberation Army Signals Intelligence and Cyber Reconnaissance Infrastructure*, Project 2049 report (11 November 2011), http://project2049.net/documents/pla_third_department_sigint_cyber_stokes_lin_hsiao.pdf and Desmond Ball, 'China's Cyber Warfare Capabilities', *Security Challenges* 17/2 (2011), 81–103.

[11] Kenneth Lieberthal and Peter W. Singer, *Cybersecurity and U.S.-China Relations*, Brookings Institution (February 2012), http://www.brookings.edu/papers/2012/0223_cybersecurity_china_us_singer_lieberthal.aspx and Mandiant Corp., *APT1: Exposing One of China's Cyber Espionage Units* (January 2013), http://intelreport.mandiant.com/Mandiant_APT1_Report.pdf.

[12] Hu Jintao, *Report to the Eighteenth National Congress of the Communist Party of China*, 8 November 2012.

[13] Craig Murray, Andrew Berglund, and Kimberly Hsu, *China's Naval Modernization and Implications for the United States* (US-China Economic and Security Review Commission, 26 August 2013), 6–7.
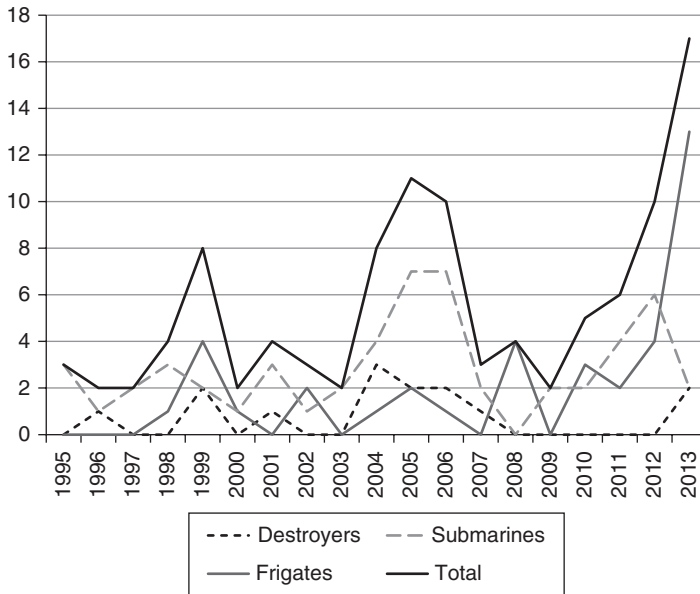
Figure 11.2. The Rate of Acquisition of Major Warships by the PLA Navy, 1995–2013

Source: Jane's Fighting Ships 2013–2014 and previous editions as presented by Ronald O'Rourke, China Naval Modernization: Implications for U.S. Navy Capabilities: Background and Issues for Congress (Washington D.C., 2014), 14, 24, and 26.

missile-coastal-patrol vessels, total numbers dipped slightly from 218 in 2000 to 214 in 2010 and are expected by ONI to rise to between 244 and 264 by 2020. The total numbers of destroyers rated as modern jumped from 20 per cent in 2000 to 50 per cent in 2010 and is estimated to increase to 85 per cent by 2020.

The PLA Navy's rate of acquisition of major warships (which covers destroyers, frigates, submarines, and aircraft carriers) averaged 4.9 annually during the 2000s, but has nearly doubled since the beginning of the 2010s, with yearly commissioning of major warships averaging 9.5 vessels between 2010 and 2013. The induction of seventeen warships into the PLA Navy in 2013 was far larger than the ten that were commissioned in 2012 and the six in 2011.[14]

In the relationship between China and the US, the PLA Navy is engaged in an asymmetric competition to push the US Navy out of the seas surrounding China. From a conventional order-of-battle perspective, the difference in total numbers of warships between the two navies does not appear to be too far apart at present, although the balance will significantly tilt in China's favour by 2020.[15] The PLA Navy in 2010 had 277 vessels according to ONI, while the US Navy had around the same number. By 2020, ONI projects that the PLA Navy will have between 313–42 warships, while the US Navy will have around 300 warships. However, the

[14] 'Intensive Commissioning of Warships Aims To Safeguard China's Maritime Rights, Interests', *Liberation Army Daily [Jiefangjun Bao]*, 9 January 2014.
[15] *Ibid.*, 36–47.

quality and technological standards of US warships are far more advanced than their Chinese counterparts so the actual capability gap between the US and Chinese navies remains far apart.

A dangerous naval racing dynamic has emerged between China and Japan since the early 2010s. A key driver is rival territorial claims over the Senkaku/Diaoyu Islands along with other territorial disputes for seabed rights to gas fields and other maritime resources in the East China Sea. The coast guards of the two countries have become a proxy for this arms race with intensive efforts on both sides to rapidly build up their forces. China's State Maritime Surveillance force, for example, has been receiving transfers of naval assets, including destroyers.[16]

Adding to these maritime tensions in the East China Sea was China's surprise announcement in 2013 of an Air Defence Identification Zone (ADIZ) that covers the airspace above the disputed Senkaku/Diaoyu Islands along with a additional airspace around these waters.[17] Half of the Chinese ADIZ also overlaps with a long-standing Japanese ADIZ. China's decision to establish an ADIZ in a major flashpoint and without any warning to its neighbours led to strong international criticism from the US, Japan, and a number of other regional countries.

The sharp escalation in the Senkaku/Diaoyu dispute appears to have been a major contributor in galvanizing a major shift in Japan's defence policy-making in the early 2010s. After more than two decades of stagnant defence budgets and lacklustre attention to military priorities, the administration of conservative prime minister Shinzo Abe issued new medium-term defence programme guidelines in 2013 under which defence spending would be modestly increased by 5 per cent over the next five years and a number of new weapons procurement programmes would be undertaken to enhance Japan's ability to defend its territorial integrity, especially outlying islands in the south of the country. Arms to be acquired include six submarines, two Aegis-equipped destroyers, long-range unmanned aerial surveillance vehicles, and the establishment of a brand-new amphibious marine unit.[18]

The military dynamic between China and India has also begun to show troubling signs of arms racing since the early 2010s. While bilateral relations between the two countries have steadily improved over the past couple of decades, competition over military matters, territorial disputes, and the contest over regional influence remains a major and unpredictable irritant. Border tensions have intensified since 2009 as Beijing began to take actions deemed provocative by Delhi, especially over renewed Chinese claims over Arunachal Pradesh. In their toughening stance on the border dispute, the Chinese authorities have warned India against stepping up its efforts to build up its military capabilities aimed at China. Indian

[16] 'Island Spat Tests Japan's Coast Guard', *Wall Street Journal*, 12 December 2012, and 'China Marine Surveillance Ships and Planes Have Increased Greatly in Confidence This Year', *Guoji Xianqu Daobao*, 28 December 2012.

[17] 'Statement by the Government of the People's Republic of China on Establishing the East China Sea Air Defense Identification Zone', *Xinhua News Agency*, 23 November 2013.

[18] Japanese Ministry of Defence, *National Defense Program Guidelines for FY 2014 and Beyond*, 17 December 2013, http://www.mod.go.jp/j/approach/agenda/guideline/2014/pdf/20131217_e2.pdf.

media outlets report that the Indian Defence Ministry approved plans in 2013 for the establishment of a 90,000-strong mountain strike corps command, along with two mountain infantry divisions and other assets to be stationed in West Bengal, intended to counter any Chinese military incursions.[19]

In the naval arena, Indian media have also reported that the Indian Navy has been significantly expanding the number of warships under the Eastern Naval Command (ENC) since the late 2000s to balance against the rise of Chinese naval power in South East Asia and the eastern approaches to the Indian Ocean. The ENC's inventory has grown from thirty in 2005 to fifty-two in 2012, which includes the addition of fourteen major warships such as missile destroyers and frigates.[20]

CHINA'S SECURITY PERCEPTIONS OF THE US AND WHAT THIS MEANS FOR ITS APPROACH TO MILITARY DEVELOPMENT

Perceptions among China's national security policy makers and planners that the US is becoming a direct military competitor, and potential adversary, appear to be gaining growing ground amid a proliferating array of security frictions and competing interests, and deepening strategic distrust between the two countries. Wang Jisi, an influential and well-placed academic foreign-policy adviser to the Chinese leadership, pointed out in a study of US–China strategic trust in 2012 that 'some high-ranking Chinese officials have openly stated that the United States is China's greatest national security threat. This perception is especially widely shared in China's defence and security establishments and in the Communist Party's ideological organizations.'[21]

These views about the increasingly contested nature of US–China security relations and interests have yet to be reflected in the authoritative Chinese strategic and military doctrines and policies that have been made public. The latter have tended to be more carefully guarded in their assessments of the US because China's overarching strategic priority continues to be economic development, which can only be effectively carried out in a peaceful non-antagonistic security environment.

The 2010 Chinese Defence White Paper, for example, in discussing the security situation in the Asia–Pacific region, pointed out that: 'profound changes are brewing in the Asia–Pacific strategic landscape, with relevant major powers increasing their strategic inputs. In particular, the United States is reinforcing its military alliances in the Asia–Pacific region and increasing its involvement in regional security affairs.'[22]

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[19] 'Indian Defence Ministry Clears Setting Up of New Mountain Corps on China Border', *The Indian Express*, 4 February 2013.
[20] 'Navy Boosting Eastern Flank', *The New Indian Express*, 31 December 2012.
[21] Kenneth Lieberthal and Wang Jisi, *Addressing U.S.-China Strategic Distrust* (Washington D.C., 2012), 13.
[22] *China's National Defence in 2010* (Beijing, State Council Information Office, March 2011).

The defence white paper is a little more forthcoming on the military technological and domain threats that China is worried about, although it avoids naming the US explicitly as the principal source behind these developments:

> The escalating international military rivalry prominently finds expression in some major powers' practice of formulating strategies for outer space, cyberspace, and polar regions, developing global rapid strike means, quickening the building of anti-missile systems, enhancing the cyber operation capability, and seizing new strategic commanding heights. All such facts show that new changes, which are profound and complex, are taking place in the international situation at a high speed, in a wide scope, and to a profound extent never seen in the past.[23]

This authoritative Chinese interpretation of the key drivers and dynamics shaping international military trends highlights several characteristics that some leading scholars have put forward as central characteristics of arms racing: 1) the rapid pace of armament transformation; 2) forging of highly offensive capabilities; and 3) the extensive and near-revolutionary nature of developments.

While official Chinese documents and policies are silent as to whether China's military developments are in response to perceived threats and actions from the US, there is discussion of these action-reaction dynamics among security analysts, scholars, and writers who work in think-tanks, universities, and media outlets affiliated with the military, state, and Communist Party.[24] In an assessment of the new US Air–Sea battle concept that is at the heart of the US strategic pivot to the Asia–Pacific region, one Chinese military academic argued that, 'the introduction of the "Air–Sea battle" concept may possibly further worsen mutual military trust. Once the United States decides to readjust its military preparations in the Asia–Pacific region, it will inevitably cause the allies of the United States in the region to readjust their military deployments in a corresponding manner, and in order to uphold national security, China will also respond to this in a corresponding manner. This kind of chain reaction in the military security realm may lead to an intense arms race.'[25]

THE 1999 CHINESE BELGRADE EMBASSY BOMBING AND ITS IMPACT ON CHINA–US ARMS RACING

An authoritative biographical account by a high-ranking PLA general of how the Chinese leadership responded to the US bombing of the Chinese embassy in the former Yugoslavia in May 1999 offers a vital clue that suggests a key driver of China's military modernization efforts since the end of the 1990s was in direct reaction to the military threat posed by the US against China.

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[23] *Ibid.*
[24] Michael Swaine, 'Chinese Leadership and Elite Responses to the U.S. Pacific Pivot', *China Leadership Monitor*, No.38, Summer 2012.
[25] Hu Xin, ' "Air–Sea Battle": Sword Pointed at East Asia', *Xiandai Junshi* [Contemporary Military Affairs], 5 October 2011.

Although the PLA and Chinese defence industry had been ramping up their defence modernization efforts since the early 1990s amid deepening fears by the Chinese authorities that Taiwan was moving towards independence, much of this effort was directed at the development of regular conventional forces, such as armoured fighting vehicles, combat aircraft, and warships. The Belgrade embassy bombing led the Chinese leadership to call for intensified efforts to develop major asymmetric-style weapons systems, or what the PLA termed as 'Assassin's Mace' or *Shashoujian* capabilities. In his memoirs, General Zhang Wannian, a vice-chairman of the Central Military Commission (CMC) during the embassy bombing, said that immediately after the embassy bombing the CMC convened an emergency enlarged meeting and one of the key decisions made was to 'accelerate the development of *Shashoujian* armaments'.[26]

Zhang pointed out that then CMC Chairman and Communist Party General Secretary Jiang Zemin was especially insistent on the need to step up the pace of development of *Shashoujian* mega-projects, saying that, 'what the enemy is most fearful of, this is what we should be developing'.[27] As the 'enemy' was the US, the implication was that the defence industry should be engaged in developing asymmetric capabilities targeting US vulnerabilities.[28] These leadership calls appear to have been turned into a major weapons technology and engineering development programme known as the 995 Project.[29]

This post-Belgrade emphasis on the development of asymmetric capabilities, or what the US has termed anti-access, area denial (A2/AD), appears to have been subsequently incorporated into China's most authoritative military guidance known as the 'National Military Strategic Guidelines for the New Period (or New NMSG -*Xin Shiqi Guojia Junshi Zhanlue Fangzhen*), which is the equivalent of the US National Military Strategy.[30] The operational component of the NMSG is known as Active Defence (*Jiji Fangyu*) that is aimed at winning local wars under informatized conditions and consists of a number of tenets that include:[31]

- China's military strategy is defensive in nature, but if attacked, will use offensive means to respond.

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[26] Zhang Wannian Writing Team, *Zhang Wannian Chuan* [Biography of Zhang Wannian] (Beijing; Jiefangjun Chubanshe [Liberation Army Press], 2011), 416.

[27] *Ibid.*, 419.

[28] There has been plenty of analysis of Chinese efforts to develop asymmetric weapons capabilities. For a provocative Chinese assessment, *see* Qiao Liang and Wang Xiangsui, *Chaoxian Zhan* [*Unrestricted Warfare*] (Beijing: Jiefangjun Wenyi Chubanshe [Liberation Army Literature and Arts Publishing House, 1999]).

[29] There is no official Chinese acknowledgement of this programme, but there are occasional allusions to it in media reports, writings by Chinese military analysts, resumes of Chinese scientists, and project listings of university laboratories and companies engaged in defence-related work. See, for example, Zeng Li, 'Investment in Defence Science and Technology', *Keji Bao* [*Science and Technology Daily*], 30 April 2009.

[30] David M. Finkelstein, 'China's National Military Strategy: An Overview of the Military Strategic Guidelines', in Roy Kamphausen and Andrew Scobell, eds., *Right Sizing the People's Liberation Army: Exploring the Contours of China's Military* (Carlisle PA, 2007), 67–140.

[31] *China's National Defence in 2008* (Beijing; State Council Information Office, 2009), 10–11.

- The PLA will wait for the optimal time and conditions to launch military operations.
- The PLA will concentrate its strengths against the opponent's weaknesses.

In its 2011 annual report on the state of Chinese military power, the US Defense Department pointed out that the New NMSG was originally formulated in 1993, after the PLA assimilated the lessons from the 1991 Persian Gulf War and the end of the Cold War, but that the guidelines were subsequently revised in 2002 and 2004 to reflect 'China's perceptions of its evolving security environment and the changing character of modern warfare'.[32] The 2011 report goes on to say that 'this strategic evolution has prompted a major shift toward investments in asymmetric, network-centric warfare and A2AD capabilities that are intended to deny elements of the modern battle space to potential enemies'.

In response to China's A2AD strategy, the US Defense Department developed the Air–Sea Battle concept in the late 2000s. The concept would improve the latest technologies available to the US to counter Chinese asymmetric capabilities, especially the use of command-and-control, long-range and precision strike, advanced-missile defences, submarine operations, and the employment of space and cyber domains. While Defense Department and military officials have sought to downplay the attention on China in the Air–Sea Battle concept and point out that it is also intended for A2AD environments elsewhere, such as the Persian Gulf, there appears to be little doubt that China is the primary focus, especially coupled with the US strategic pivot to East Asia.

DOMESTIC DYNAMICS

Domestic dynamics also play an important role in accounting for the quickening pace of China's arming and a more assertive external defence and security posture since the late 2000s. Of particular significance is a greater voice by the PLA in policy making, in public discourse, and the emergence of a more influential defence-industrial constituency.

The PLA has become more emboldened within the Chinese political and bureaucratic systems over the past decade, although it has been careful in doing this by constantly emphasizing its complete obedience to the Communist Party. A key reason for this is that the nature of bureaucratic politics has evolved over the past decade to benefit powerful long-standing constituencies with close affiliations to the party, and especially its 'control' apparatus, which includes the military, internal security forces, select industrial sectors, and propaganda system. These institutions are well represented at the highest-level decision-making organs, such as the Politburo Standing Committee, the full Politburo, and the State Council.

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[32] *Military and Security Developments Involving the People's Republic of China 2011*, 22.

During Hu Jintao's tenure as Communist Party General Secretary and CMC Chairman between 2004 and 2012, these groups were able to expand their influence and autonomy because top leadership bodies, such as the Politburo Standing Committee, appeared to become less prominent and less decisive in policy-making. One explanation was that the Politburo Standing Committee had become too large and unwieldy with nine members, which slowed decision-making because of its consensus-based format. Another reason put forward was that Hu Jintao either did not like to take major decisions, or lacked the ability to enforce the decisions, and this led to a de facto delegation of authority to the implementation bodies to carry them out.

In the national security and external arenas, the PLA moved to fill this opening in the policy space and become more assertive, which sometimes led to frictions with other bureaucratic groups operating in the same areas. One example of the PLA's activism took place in the summer of 2010, when senior Chinese military officials and serving and retired strategists belonging to military think-tanks made widely publicized statements aggressively opposing the US and the Republic of Korea conducting joint naval exercises in international waters near China. Following remarks by General Ma Xiaotian, a deputy chief of the general staff, who said that China was 'strongly opposed' to the manoeuvres, the Chinese Foreign Ministry adjusted its initially mild concerns to a more forceful warning that the US needed Chinese permission before it could send its naval forces near to Chinese waters.[33]

The intensifying pace of the PLA's modernization and expansion of its military-technological capabilities has also led to strains in civil-military relations, especially on the issue of civilian involvement and oversight of highly sensitive weapons programmes. Two events illustrate the emergence of civil-military coordination gaps. One was the anti-satellite test in January 2007, when the PLA used a modified ballistic missile to destroy one of its own satellites in space. After the incident became public, the international community pressed the Chinese government for an explanation. The Chinese Foreign Ministry took nearly two weeks before acknowledging that China had conducted the test, which led to speculation as to whether the PLA was acting independently and without seeking approval from the civilian authorities.[34] But it is unlikely the military was acting in a rogue capacity, as no senior military officer faced any sanctions over the test. Indeed, General Chen Bingde, the PLA officer in charge of the event, was subsequently promoted to take charge of the General Staff Department.

The second event was the maiden public test flight of the J-20 fighter aircraft in January 2011. The flight appeared to catch Hu Jintao unaware when he was asked about it during a meeting with visiting US Defence Secretary Robert Gates. None of Hu's aides in the meeting with Gates appeared to have any knowledge of the J-20 flight, even though it had been reported on the Internet

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[33] 'China Warily Eyes U.S.–Korea Drills', *New York Times*, 20 July 2010.
[34] James Mulvenon, 'Rogue Warriors? A Puzzled Look at the Chinese ASAT Test', China Leadership Monitor, No. 20, and Eric Hagt, 'China's ASAT Test: Strategic Response', *China Security* (Winter 2007), 31–51.

prior to the meeting.[35] Suggestions that the PLA did not inform Hu about the project appear unlikely, and it may be more the case that the specifics of the J-20 testing programme were not passed sufficiently high up the reporting channels to reach Hu.

While these incidents indicate that there may be occasional coordination gaps in civil-military relations, and that the PLA is becoming more assertive and taking advantage of opportunities to push for its interests, they do not show a military systematically acting on its own in pushing for an arms race, or other bold actions that may not be in line with the rest of the leadership elite. The PLA remains deeply embedded within the Chinese political system, and there are robust checks and balances to ensure that the Communist Party is able to safeguard the loyalty of the military.

Another new dynamic adding to external perceptions that the PLA is becoming more bellicose is the appearance of retired and semi-retired military officers, along with military academics, as media commentators on current national security and defence issues since the early 2000s. Many of these commentators are affiliated with leading PLA research entities such as the National Defence University (NDU), Academy of Military Sciences (AMS), and think-tanks belonging to PLA service arms. They regularly appear on popular and influential media outlets such as Chinese Central Television, Xinhua News Agency, and the Liberation Army Daily, which is the PLA's official mouthpiece.

Many of the military commentators are conservative and strongly nationalist in their views. They include Major Generals Luo Yuan, Peng Guangqian, and Yao Youzhi, all formerly from AMS, Rear Admiral Yang Yi and Major General Zhu Chenghu from NDU, and Rear Admiral Yin Zhuo from the PLA Navy. Some of them have urged the PLA and civilian leaderships to step up the pace of China's military modernization and retaliate against actions by the US and other countries that are viewed as detrimental to China's military and security interests, such as US arms sales to Taiwan.

One of the most outspoken and influential military commentators is Luo Yuan, who is a loud advocate of engaging in an arms race against the US, especially in retaliation for its arms sales to Taiwan. Luo has argued that China should take tough countermeasures to break out of a routinized cycle that follow these arms sales, in which Beijing temporarily freezes military-to-military ties before resuming them. Following the US announcement in January 2010 that it would sell a $6.4 billion arms package to Taiwan, Luo said that China needed to move beyond 'soft' retaliatory measures—diplomatic protests, limited sanctions, curtailment of exchanges—and adopt 'hard' actions. These tougher steps include: boosting Chinese defence spending; accelerating the pace of weapons research, development, and production; increasing weapons imports; following Russia's example of deploying Topol-M missiles and short-range missiles to Kalingrad as a response to the US

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[35] Recollection of a senior US official who was present at the meeting, May 2012. See also John Pomfret, 'Chinese Army Tests Jet During Gates Visit', *Washington Post*, 12 January 2011, and Elizabeth Bumiller and Michael Wines, 'Chinese Army Test Jet as Gates Visits', *New York Times*, 12 January 2011.

decision to base missile defence systems in the Czech Republic and Poland; and selling some of China's large holdings of US treasury bonds.[36]

A key question is whether these commentators are expressing their personal views or are a conduit for hawkish elements within the PLA, which would like the central authorities to take a tougher stance in its approach to national security and external relations, especially enhancing China's military capabilities. These conservative constituencies in the PLA are becoming more active and influential, which is demonstrated by the PLA's more robust and assertive reactions to US intelligence-gathering and monitoring activities close to Chinese air and maritime boundaries, as well as the deployment of US military assets in the seas around China.[37]

The defence-industrial complex is adding its considerable political and bureaucratic clout in pushing for stepping up the pace and scale of China's armament drive. The defence industry has found very strong and sustained political support from the highest levels of the civilian and military leaderships since the end of the 1990s for its efforts to expand and upgrade its scientific, technological, and industrial capabilities. This has been translated into the elevation of defence-industrial issues to the top of government priorities, significant increases in the allocation of financial, human capital, and other resources, enactment of a raft of regulations, policies and plans to support defence industrialization and innovation, and active leadership intervention to tackle structural obstacles that have often stymied progress.[38]

The political and bureaucratic power of the defence industrial apparatus is centred on the ten large-scale state-owned defence corporations that increasingly dominate the six sectors making up the defence industry: shipbuilding, aviation, space and missiles, nuclear, ordnance, and electronics and information technology. These corporations are sprawling monopolies that consist of between several dozen and several hundred subsidiaries. They have enjoyed consistently rising annual profits since the early 2000s because of a major and sustained surge in defence and civilian orders. Annual revenue growth from the 'big ten' since the mid-2000s has averaged around 20 per cent, which is significantly higher than the 11.8 per cent average annual increase of the officially published defence budget for the same period.[39] The 'big ten' are estimated to have collectively earned profits of around Rmb 85 billion in 2012, which is the highest in the defence industry's history.[40]

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[36] 'US Arms Sales to Taiwan Give Added Legitimacy to China's Arms Expenditures', *Phoenix Satellite Television*, 29 January 2010; and 'Counter US Arms Sales to Taiwan With a Strategic Combined Fist', *Liaowang*, 8 February 2010.

[37] Thomas J. Christensen, 'The Advantages of an Assertive China', *Foreign Affairs* (March-April 2011), 54–67.

[38] Tai Ming Cheung, *Fortifying China* (Ithaca NY, 2009).

[39] *Military and Security Developments Involving the People's Republic of China 2012* (Washington D.C., May 2012), 6.

[40] This estimate comes from the University of California Institute on Global Conflict and Cooperation's Study of Innovation and Technology in China Project based upon an examination of the 2011 financial information disclosed by the ten defence corporations.
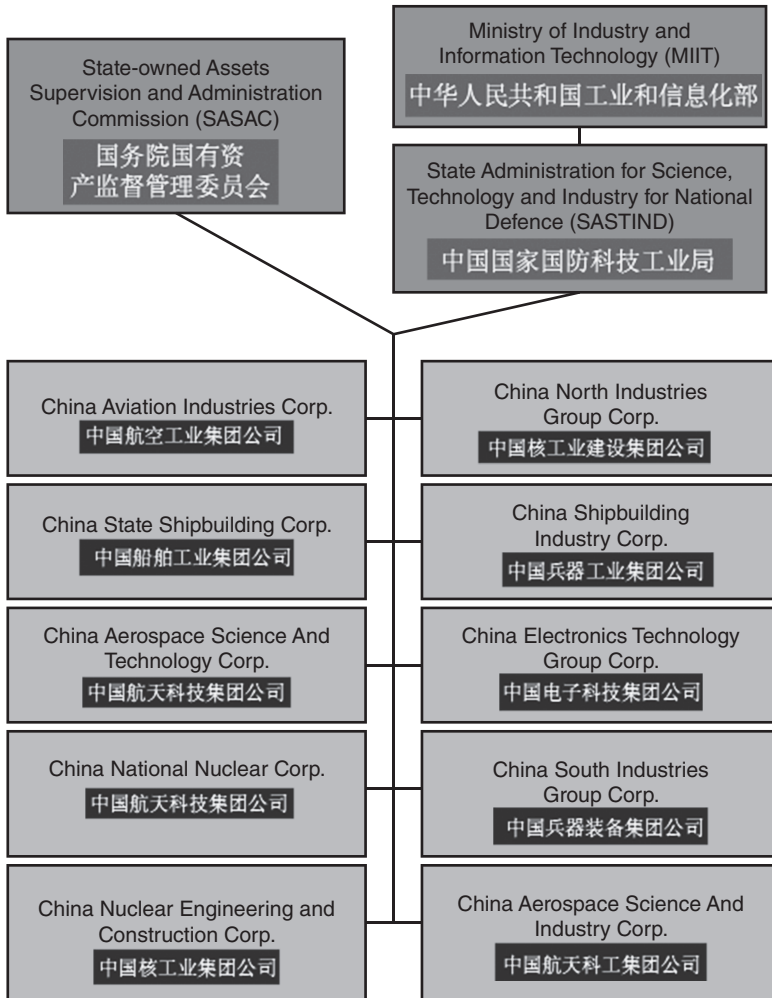
Figure 11.3. China's Top Ten Defence Industrial Corporations

Analysis of financial data released by these defence corporations suggest that the overall scale of the PLA's acquisitions maybe significantly larger than disclosed from official defence budget figures. Using an estimate based upon past official disclosures that roughly one-quarter of the annual income of the ten defence corporations comes from defence-related business, this would total around Rmb 370 billion ($58 billion) for 2012.[41] Even accounting for modest levels of foreign arms

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[41] The most recent official figures on the ratio between civilian and military production output by the Chinese defence industry was in 2006 and 2007, when civilian output accounted for 74 and 78 per cent of total industry output value respectively. *See* Lu Zhou, 'Profits of Military Industrial Enterprises Last Year was Rmb 43 billion, Double the Profit of Three Years Ago', *China Securities Journal*, 8 January 2008.
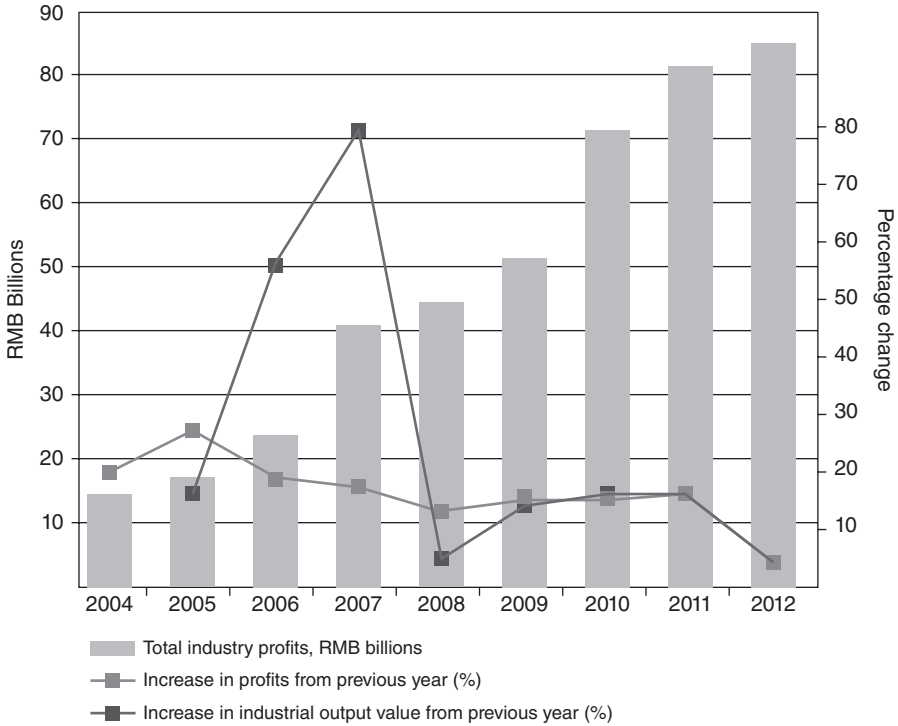
Figure 11.4. Financial Performance of the Chinese Defence Industry, 2004–2012

exports, which is estimated to be between US$1–1.4 billion annually, these figures suggest that Chinese military research, development, and acquisition (RDA) spending is at least 50 per cent higher than official figures would imply.[42]

Not surprisingly, defence corporations have played prominent roles in lobbying for the development of costly advanced weapons systems that are driving external concerns about the direction of China's military build-up. For example, one of the foremost advocates for the development of indigenous Chinese aircraft carriers is China State Shipbuilding Corporation (CSSC), the country's principal shipbuilder and the company responsible for the overhaul and refurbishment of China's first-ever aircraft carrier, the *Liaoning*. Shortly after the *Liaoning* was handed over to the PLA Navy in late 2012, CSSC Chairman Hu Wenming declared in a media interview that: 'we must enhance our independent weapons and equipment research and production capacity to match the country's clout, and independently build our own aircraft carriers,' adding that 'developing aircraft carriers and other new-generation armament for the navy is tailored for the country's defence and the need

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[42] The Stockholm International Peace Research Institute (SIPRI) estimates that Chinese arms exports in 2009 totalled $1 billion, $1.1 billion in 2010, and $1.35 billion in 2011. http://armstrade.sipri.org/armstrade/html/export_toplist.php, accessed 4 September 2012.

to protect marine rights and interests.'[43] Hu appears to have had his wish come true when the Liaoning Communist Party Secretary, Wang Min, disclosed in January 2014 that the Dalian Shipyard had began building China's first domestic aircraft carrier.[44]

These corporations are now engaged in ambitious expansion strategies to turn them into global arms and strategic technology champions. A key plank of this approach is to increase the size of these enterprises so they are able to compete with their much larger Western rivals. They have set extremely high growth targets over the coming years that are based on expectations of accelerating levels of acquisitions from the PLA as well as major success in arms exports. As Asia–Pacific is a key market for Chinese defence firms, especially countries such as Pakistan, the potential for a rising tide of Chinese arms flowing across the region and beyond could also deepen international concerns of China's expanding military footprint.

CONCLUSIONS: A RISING AND MORE BELLICOSE CHINESE MILITARY ESTABLISHMENT AND THE PROSPECTS FOR CONFLICT IN EAST ASIA

This chapter began by posing the question of whether East Asia is in, or moving towards, a major arms race, especially one in which China is competing against the US and other regional states. The examination of China's military development over the past two decades show that its behaviour, rationales, and resource allocations since the late 2000s are tending more towards a classic form of arms racing, which is intensive, competitive, and offensive in nature, rather than the less intensive and more defensive forms of modernization. This is especially true as China seeks to race from behind and narrow the gap with the US. Moreover, in a number of specific areas, such as A2AD, cyber, and perhaps space, there is a more direct action-reaction cycle taking place between China and the US.

While China's current stage of military building is not yet a fully fledged regional arms racing dynamic, but more of a hybrid enhanced modernization with growing elements of regional arms racing, the coming years will likely see the balance tip even more towards an assertive regional arms-racing approach. The concerted efforts of the Chinese defence establishment to build up China's military capabilities are being strongly backed by the country's leadership. At the 18th Party Congress, Hu Jintao pointed out that a 'new global revolution in military affairs is gathering pace' and that China should accelerate the speed of its military development efforts to catch up with the world's advanced military powers by the 2020s.[45]

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[43] 'We Are Ready To Build More Carriers', *China Daily*, 20 November 2012.
[44] 'Liaoning Party Secretary Wang Min Discloses That Dalian is Now Building New Aircraft Carrier', *Global Times [Huanqiu Ribao]*, 20 January 2014, http://military.china.com/important/11132797/20140120/18299097.html.
[45] Hu Jintao, *Report to the Eighteenth National Congress of the Communist Party of China*.

What are the implications of China's arms racing for regional security and the threat of war? One major concern is the lack of transparency as to what China and the PLA is thinking and doing with its military build-up. Modest reforms have been undertaken in recent years to improve the disclosure of military information, such as with the release of a defence white paper every two years and the establishment of a defence spokesperson office.[46] But these are cosmetic rather than substantive changes and do not address a deepening sense of distrust and concern that the international community has over China's military intentions and long-term trends. Core transparency issues such as detailed breakdown of defence budgets and disclosures of weapons programmes and force deployments continue to remain off-limits. This can only fuel uncertainty and the need for other countries to take countermeasures.

The dismal lack of transparency in China's military development means the outside world is unsure of China's fundamental strategic intentions. Is the country status quo minded and security-seeking, or revisionist and/or expansionist?[47] Chinese leaders insist that their military actions are defensive in nature and they have no offensive designs. This was mostly the case between the 1980s and 2000s, as the country pursued economic development and emphasized an accommodationist grand strategy.

But the situation changed in the late 2000s, as China's policy elite sensed that US dominance of the international system might be in jeopardy in the wake of the global financial crisis that seriously hobbled the US economy, and the draining commitment to wars in Iraq and Afghanistan. China sought to capitalize on this opening by pursuing a more assertive international posture, but it has alienated many of its regional neighbours and the US by aggressively pushing its territorial claims and other interests. Although China softened its approach after a strong international backlash in 2009–10, this proved to be temporary, and it resumed its hard-line stance in the early 2010s. Indeed, Beijing's current approach appears to be even more belligerent, as it is more willing to flex its military might, such as in its territorial disputes with Japan and the Philippines.

To signal that this tough-minded and more militarized approach may be an important element in a more robust and less accommodating Chinese grand strategy, the new Chinese leadership of Xi Jinping has called for the PLA to step up its preparations for 'military struggle', which means to beef up its war-fighting readiness to deter the US and other regional countries and further accelerate its pace of military building.[48] The PLA's propaganda apparatus quickly followed up by launching a large-scale campaign to emphasize the need for military units to be better prepared to go to war. An authoritative article in *Qiushi*, a prominent Communist

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[46] For an annual review of the state of China's defence transparency compared with Japan, South Korea, Russia, and the US, see the Northeast Asia Defense Transparency Index by the University of California Institute on Global Conflict and Cooperation at https://igcc.ucsd.edu/research-and-programs/programs/regional-issues/defense-transparency-project/defense-transparency-index/index.html.

[47] Alastair Iain Johnston, 'Is China a Status Quo Power?' *International Security* 27/4 (2003), 5–56.

[48] 'Chinese Military Leaders Call for Enhancing Combat Preparedness', *Xinhua News Agency*, 6 February 2013.

Party journal, with the byline of the PLA General Staff Department, offers an insight into the thinking behind this more bellicose talk. The article is a rallying call to the military to change its mind-set from a peacetime force into a war-fighting outfit ready to defend the country's national security vigorously. The article points out that 'being able to fight and win battles and accelerate national defence and armed forces modernization is a glorious mission'. The PLA, the article further explains, 'faces an unprecedented historic opportunity, as well as an unprecedented severe challenge. The situation is pressing, and if we do not advance then we are going backward. We must revolve around the fundamental goal of being able to fight and win battles, keep up with the trend of development in military affairs worldwide, accelerate the transformation in military affairs with Chinese characteristics, shrink the gap in military strength between us and the world's big powers, and work hard to seize the strategic initiative in the competition in military affairs.'[49]

This official fanning of a more strident and gung-ho attitude among the country's soldiers will contribute to a growing sense among China's neighbours and major Asia–Pacific powers that a more aggressive China is on the move and stepping up its military building and arms racing. It will also likely add to the potential for military conflict, especially inadvertent clashes sparked by miscommunications and accidents, as regional militaries and their proxies come into increasingly close contact with each other. The US and Japanese navies have already encountered a number of angry confrontations with Chinese naval and maritime proxy actors in the past few years. One of the biggest problems with arms racing and war talk in East Asia in the twenty-first century is the conspicuous absence of any developed mechanisms to promote confidence building, manage crises, and define operational rules of the road at the bilateral or regional levels.

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[49] PLA General Staff Department, 'Advance Military Work By Revolving Closely Around the Ability to Fight and Win Battles', *Qiushi* [*Seeking Truth*], 1 February 2013.

12

Armaments Developments Since the Cold War

Thomas Mahnken

This paper argues that armaments development since the end of the Cold War has passed through two phases, and that a third is on the horizon. During the first phase, the United States took an early lead in exploiting the promise of precision-strike systems and used precision weaponry to gain a major battlefield edge over both states and terrorist groups. However, the very success of the United States' exploitation of new methods of war brought on the second phase, during which states and non-state actors began both to acquire those methods for themselves and to develop countermeasures against them. This can be seen most dramatically in China's acquisition of so-called anti-access/area-denial (or, in Chinese parlance, 'counter-intervention') capabilities. Such developments threaten to diminish considerably the ability of the United States to project power. The third phase, which is only now coming into sight, will consist of responses to the emergence of anti-access capabilities. The most prominent example of this to date is the development of the so-called Air–Sea Battle concept by the US Navy and Air Force.

We are, in other words, witnessing an unfolding competition between the ability to project power, on the one hand, and the ability to deny access, on the other. One of the main features of this competition is the development and diffusion of precision-strike capabilities. Although characterized by strategic interaction, it is not a closely coupled arms race of the sort postulated by Cold War theorists. Interaction between the key actors has been episodic and multipolar, and domestic considerations have played a prominent role. A more traditional arms race could emerge in the future, of course, but its emergence is hardly preordained.

This paper begins by describing arms-race theory, including both external and internal sources of arms competition. It goes on to describe the three phases of armaments developments since the end of the Cold War. It concludes by assessing whether the emerging competition between power projection and anti-access capabilities qualifies as an arms race.

EXTERNAL SOURCES OF ARMS COMPETITION: THE ACTION-REACTION MODEL

As chapters throughout this volume have made clear, both the external environment and domestic influences shape the features of an arms race. The most simplistic formulation of how the external environment affects armament decisions is the 'action-reaction' model of an arms race.[1] As Barry Buzan and Eric Herring have written, 'The basic proposition of the action-reaction model is that states strengthen their armaments because of the threats the states perceive from other states. The theory implicit in the model explains the arms dynamic as driven primarily by factors external to the state.'[2]

The action-reaction model of arms races holds that exaggerated fears and overestimation of opposing threats will lead competitors into ever increasing levels of armaments and arms spending. It rests upon the assumption that the armaments decisions of the competitors are closely coupled: that is, that the actors pay close attention to one another and that the magnitude and timing of their responses are directly related to their opponent's actions. In practice, however, the awareness of adversarial actions and the magnitude and timing of responses may vary considerably. As a result, strategic interaction can range from closely coupled action-reaction dynamic to strategic autism, under which each competitor ignores the outside environment and is driven entirely by domestic considerations.

In fact, the action-reaction model represents but one hypothesis regarding how and why external events can create arms competition. Others include deterring an adversary from engaging in inimical military behaviour, achieving a more favourable outcome if war should none the less occur, increasing the state's diplomatic weight, using another state's modernization to pace its own armaments, and preserving or enhancing a state's dignity and prestige. Finally, the emergence of new technologies that render existing arms obsolescent may also drive arms competitions.[3]

INTERNAL SOURCES OF ARMS COMPETITION

Arms competitions have domestic determinants as well, and as noted above, these determinants may dominate the decision making of competitors. A second set of theories deals with how a state's political leadership, military leadership, military services, and research and development bureaucracy all affect arms decisions. The

[1] Barry Buzan and Eric Herring, *The Arms Dynamic in World Politics* (London, 1998), chapter 6.
[2] *Ibid.*, 83.
[3] Colin S. Gray, 'The Urge to Compete: Rationales for Arms Racing', *World Politics* 26, no. 2 (January 1974), 210–27.

domestic structure model rests on the idea that forces within the state generate arms competitions. Such domestic-structure explanations include institutionalization of military R&D, institutionalization of military production, military budgeting process, electoral politics, military-industrial complex, and organizational politics.[4]

First, a state's political objectives play a major role in determining arms decisions. At least since the end of the Second World War, US arms decisions have been driven by the need to project power to defend allies and interests and to ensure the free flow of goods and services across the global commons. In the case of China, by contrast, the need to coerce Taiwan while deterring, delaying, and defeating US intervention has been a major driver of Chinese arms investments.

Second, bureaucratic politics influence arms decisions. Competition for funding between the armed services helps shape what the United States buys and when. In the case of China, for example, competition between weapons design bureaux and military services may play an important role in determining the shape of Beijing's arms investments. For example, both the People's Liberation Army Air Force (PLAAF) and Second Artillery Force have indicated their intent to establish space operations as a core competency.[5]

Third, the organizational culture of armed services influences what they choose to buy. It appears that the organizational culture of the PLA has influenced China's arms acquisitions. The decision to develop the DF-21 MRBM, for example, appears to have arisen because Chinese leaders preferred land-based ballistic missiles over SLBMs.[6] Similarly, each of the US armed services has preferences that are expressed in what it chooses to purchase.

Fourth, the structure of bureaucratic processes such as arms acquisition systems influences arms decisions. Mark Stokes, for his part, has noted how the Chinese aerospace industry's incremental improvement strategy influences the structure and timing of Chinese missile programs.[7] Finally, the development of new technology may influence arms decisions, whether to keep up with rivals or with the state of the art.

THE EMERGING POWER PROJECTION/ANTI-ACCESS COMPETITION

Phase I: Power Projection Unchallenged

The end of the Cold War and the collapse of the Soviet Union witnessed an era of unchallenged American dominance in international affairs, inaugurating a period

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[4] See Buzan and Herring, *The Arms Dynamic in World Politics*, chapter 7.

[5] Mark A. Stokes and Dean Cheng, *China's Evolving Space Capabilities: Implications for U.S. Interests* (Washington, D.C.: Project 2049 Institute, 2012), 45.

[6] John Wilson Lewis and Hua Di, 'China's Ballistic Missile Programs: Technologies, Strategies, Goals', *International Security* 17/2 (1992), 21.

[7] Mark A. Stokes and Ian Easton, *Evolving Aerospace Trends in the Asia–Pacific Region: Implications for Stability in the Taiwan Strait and Beyond* (Washington, D.C.: Project 2049 Institute, 27 May 2010), 9.

that Charles Krauthammer dubbed, 'The Unipolar Moment'.[8] Reflecting on this dominance, French foreign minister Hubert Védrine famously characterized the United States as a 'hyperpower', arguing that 'U.S. supremacy today extends to the economic, currency, military areas, lifestyle, language, and the products of mass culture that inundate the world, forming thought and fascinating even the enemies of the United States.'[9]

In the military sphere, the post-Cold War period coincided with the acquisition by the United States of a range of new arms. These included precision-guided munitions (PGMs), advanced imagery systems and sensor platforms such as the Joint Surveillance and Targeting System (JSTARS) aircraft, as well as the command-and-control systems needed to knit them together. The result of decades of Cold War research, driven by the need to give the US armed forces a technological edge against the numerically superior Warsaw Pact, these capabilities gave the United States a marked advantage over lesser adversaries in the years that followed the end of the US–Soviet competition.

The 1991 Gulf War served as a showcase for the ability of the US to project power unmolested and employ new ways of war with impunity. Indeed, the Gulf War was the least constrained conflict the United States had fought since the Second World War. Although Iraq possessed chemical and (as was later discovered) biological weapons and was close to a nuclear capability, the United States and its allies did not face the threat of nuclear escalation that a confrontation with the Soviet Union would have entailed. In fact, the Soviet Union, far from being antagonistic, passively supported the US-led coalition. Moreover, the Iraqi government chose not to use the limited ability it had to interfere with US force deployments. As a result, the United States and its allies were able to deploy hundreds of thousands of troops, hundreds of aircraft, and massive amounts of munitions and logistical support over the course of months to Iraq's periphery; to establish and use, unmolested, training areas adjacent to Iraq; and to enjoy unfettered access to ports and airfields in the Gulf region and Turkey. When they had assembled their full might, and absent an Iraqi withdrawal from Kuwait, the US-led coalition were able to use their military dominance to full effect, unleashing Operation DESERT STORM to force Iraq out of Kuwait and restore the Kuwaiti government.

The seeming ease with which the US-led coalition defeated Iraq during the 1991 Gulf War caused many observers in the United States and elsewhere to conclude that the information revolution was bringing about a revolution in military affairs (RMA).[10] In their view, the lopsided battles in the deserts of Kuwait and

[8] Charles Krauthammer, 'The Unipolar Moment', *Foreign Affairs* 70/1 (1990/91), 13–48; Samuel P. Huntington, 'The Lonely Superpower', *Foreign Affairs* 78/2 (1999), 35–49. See also Charles Krauthammer, 'The Lonely Superpower', *The New Republic*, 29 July 1991, 23–7; Charles Krauthammer, 'The Unipolar Moment Revisited', *The National Interest* (Winter 2002–3), 5–17.

[9] Lara Marlowe, 'French Minister Urges Greater UN Role to Counter U.S. Hyperpower', *The Irish Times*, 4 November 1998. See also Hubert Védrine with Dominique Moisi, *France in the Age of Globalization* (Washington, D.C.: Brookings Institution Press, 2001), 2, François Heisbourg, 'American Hegemony? Perceptions of the U.S. Abroad', *Survival* 41/4 (1999–2000), 5–19.

[10] See, for example, William J. Perry, 'Desert Storm and Deterrence', *Foreign Affairs* 70/4 (1991): 66–82; Andrew F. Krepinevich, 'Cavalry to Computer: The Pattern of Military Revolutions', *The*

southern Iraq and the seemingly effortless domination of the Iraqi Air Force signalled that warfare had indeed changed. The contrast between pre-war expectations of a bloody fight and the wartime reality of Iraqi collapse struck many as indicating a transformation in warfare. Not lost on observers was the fact that US and coalition forces defeated Iraqi forces largely equipped with the sort of Soviet-supplied hardware that the United States would have faced had NATO and the Warsaw Pact gone to war.

The impact of new ways of war was nowhere more apparent than in the air. The combination of the stealthy F-117 *Nighthawk* aircraft and PGMs gave US forces extremely high effectiveness. A typical non-stealth strike formation in the Gulf War required thirty-eight aircraft, including electronic warfare and defence suppression aircraft, to allow eight planes to deliver bombs on three targets. By contrast, only twenty F-117s armed with 2,000-lb laser-guided bombs (LGBs) were able simultaneously to attack thirty-seven targets in the face of a challenging Iraqi air defence. As a result, although F-117s flew only 2 per cent of the total attack sorties in the war, they struck nearly 40 per cent of strategic targets, such as leadership- and command-and-control facilities. In addition, the war witnessed the innovative use of PGMs to strike not only fixed strategic targets and hardened aircraft shelters, but also Iraqi tanks in revetments. On one night alone, forty-six F-111F attack aircraft dropped 184 LGBs, which destroyed 132 Iraqi armoured vehicles.[11] Despite the fact that PGMs accounted for only 8 per cent of the bombs dropped over Kuwait and Iraq, televised scenes of US aircraft bombing targets with precision, broadcast worldwide, became the most evocative images of the war.

In the years that followed, the war became a central reference point in debates in the United States and abroad over the hypothesis that an RMA was under way.[12] Some of the more breathless RMA advocates in the United States argued that the information revolution marked a complete break with the past. One 1993 report predicted: 'The Military Technical Revolution has the potential fundamentally to reshape the nature of warfare. Basic principles of strategy since the time of Machiavelli…may lose their relevance in the face of emerging technologies and doctrines.'[13] The authors of the Air Force's official study of the Gulf War were closer to the mark when they concluded, 'The ingredients for a transformation of war may well have become visible in the Gulf War, but if a revolution is to occur someone will have to make it.'[14]

National Interest (Fall 1994); and Eliot A. Cohen, 'A Revolution in Warfare', *Foreign Affairs* (March/April 1996).

[11] Mahnken, *Technology and the American Way of War*, 169, 171.

[12] Keith L. Shimko, *The Iraq Wars and America's Military Revolution* (Cambridge: Cambridge UP, 2010), 23.

[13] Michael J. Mazarr et al., *The Military Technical Revolution: A Structural Framework* (Washington, D.C.: Center for Strategic and International Studies, 1993), 28.

[14] Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey Summary Report* (Washington, D.C.: Department of the Air Force, 1993), 251.

The Gulf War served as a reference point for foreign militaries as well.[15] Soviet military observers saw the Gulf War as the apotheosis of the RMA that they had been predicting for more than a decade. Indeed, the idea that the emergence of new technology, combined with innovative operational concepts and organizations, would transform the conduct of war first appeared in Soviet military writings in the late 1970s when a group of Soviet officers—led by Marshal Nikolai Ogarkov, the chief of the Soviet general staff—began arguing that computers, space surveillance, and long-range missiles were changing the character of war.[16] Their main concern was that the United States appeared to be exploiting these technologies much more aggressively than the Soviet Union. They feared that the development of new technology into what the Soviets termed 'reconnaissance-strike complexes' would give the United States a significant battlefield edge over the Soviet Union. The lopsided outcome of the Gulf War, and particularly the ease with which the United States and its allies had defeated Iraq's Soviet-supplied hardware, confirmed these fears.[17]

Chinese military observers similarly saw the Gulf War as marking a discontinuity that heralded a new era in warfare.[18] Chinese military doctrinal publications in the 1990s began referring explicitly to a RMA. In 1993 the Central Military Commission issued the 'Military Strategic Guidelines for the New Period' as a result of an assessment of the international environment in the wake of the Cold War and demise of the Soviet Union and communist regimes in Eastern Europe as well as the changing character of war after the Gulf War in 1991. The guidelines introduced the concept of *active defence*, which stressed precise and well-timed offensive operations, training, taking the initiative, and attacking enemy weaknesses.[19] The Chinese military devoted considerable effort to understanding the implications of the Gulf War for modern warfare. These were subsequently incorporated into a new generation of doctrinal publications that began to be published in the 1990s.

Individual militaries viewed the emergence of new ways of war through the lens of the strategic and operational challenges that they faced. For many European militaries, advanced weaponry offered the ability to trade quality for quantity in the midst of post-Cold War drawdowns. The prospect of striking with precision also appealed to liberal democracies as a way to reduce the death of innocents.

For many, the problem was not how to project military power, but rather how to deter, delay, and disrupt attempts by others—and particularly the United

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[15] See the essays in Emily O. Goldman and Thomas G. Mahnken, eds., *The Information Revolution in Military Affairs in Asia* (New York, 2004).

[16] See, for example, Stephen J. Blank, 'The Soviet Strategic View: Ogarkov on the Revolution in Military Technology', *Strategic Review* (summer 1984), 3.

[17] See, for example, Mary C. FitzGerald, *Impact of the RMA on Russian Military Affairs* (Washington, D.C.: Hudson Institute, 1997).

[18] Jacqueline Newmyer, 'The Revolution in Military Affairs with Chinese Characteristics', *The Journal of Strategic Studies* 33/4 (2010), 481–504.

[19] David M. Finkelstein, 'China's National Military Strategy: An Overview of the "Military Strategic Guidelines"', *Asia Policy* 4 (2007), 67–72.

States—to project power against them.[20] In 1993, analysts in the US Department of Defense's Office of Net Assessment dubbed such then-theoretical approaches 'anti-access/area-denial' strategies.

In the wake of the Gulf War, American defence analysts, who had first become aware of the concept of an RMA through their monitoring of Soviet writings, began to pay greater attention to the prospect that the character and conduct of war was changing. Foremost among them were the analysts in the Pentagon's Office of Net Assessment, led by Andrew W. Marshall. In early 1991 Marshall commissioned an assessment of how the information revolution might affect warfare. The result was a 1992 report entitled 'The Military-Technical Revolution: A Preliminary Assessment', which was circulated within the leadership of the Defense Department, to mainly favourable reviews.[21]

Beginning in 1993, defence experts began talking less about a military-technical revolution (MTR) and more about an RMA. Marshall felt that the former term emphasized technology and while technology makes revolutionary change possible, revolutions take place only when the armed force develop new concepts of operations and create new organizations. In his view, the key task facing the armed forces was not to rush out and purchase new equipment, but to figure out the most appropriate conceptual innovations and organizational changes. He also noted that the information revolution was likely to unfold over the span of decades. He thus felt it best to talk about an 'emerging military revolution'.[22]

In Marshall's view, there were two plausible ideas about how the information revolution might lead to a revolution in warfare:

> The first is that long-range precision strike weapons coupled to very effective sensors and command and control systems will come to dominate much of warfare. Rather than closing with an opponent, the major operational mode will be destroying him at a distance […] The second idea is the emergence of what might be called information warfare. The information dimension or aspect of warfare may become increasingly central to the outcome of battles and campaigns. Therefore, protecting the effective and continuous operation of one's own information systems, and being able to degrade, destroy, or disrupt the functioning of the opponent's, will become a major focus of operational art.[23]

Marshall warned, however, that the high operational tempo of the US armed forces, the pervasive nature of the information revolution, and the conceptual challenges associated with understanding the information revolution all posed barriers to exploiting the RMA.

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[20] See, for example, Thomas G. Mahnken, 'America's Next War', *The Washington Quarterly* 15/3 (1993), 185–203.

[21] Andrew F. Krepinevich, Jr, *The Military-Technical Revolution: A Preliminary Assessment* (Washington, D.C.: Center for Strategic and Budgetary Assessments, 2002), i.

[22] Andrew W. Marshall, 'Some Thoughts on Military Revolutions', memorandum for the record, July 27 1993, 1. Copy obtained from A. W. Marshall and in the possession of the author.

[23] Statement of Andrew W. Marshall, Director, Net Assessment, Office of the Secretary of Defense, before the Senate Armed Services Committee Subcommittee on Acquisition and Technology on 5 May 1995, p. 1. Copy obtained from A. W. Marshall and in the possession of the author.

The hypothesis that the information revolution was spawning a revolution in military affairs gained high-level support in 1994 with the appointment of William J. Perry as Secretary of Defense and Admiral William A. Owens as Vice Chairman of the joint chiefs of staff. Perry had played an important role in sponsoring many of the technologies associated with the RMA while serving as Undersecretary of Defense for Research and Engineering from 1977 to 1981. Owens was a prominent exponent of the view that the US armed forces could realize a major increase in effectiveness by networking together existing weapons, sensors, and command-and-control systems into a 'system of systems'. In his view, linking these systems would produce information superiority—or 'dominant battlespace knowledge'—and enable a quantum leap in military effectiveness.[24] Both pressed the military to embrace new concepts of operations.

In 1996, the joint chiefs of staff published *Joint Vision 2010*, a document that was supposed to serve as a template for US force modernization. The document argued that technological change could enable a new level of performance across the full range of military operations. It saw information superiority as the key to future military effectiveness, arguing that it would enable four operational concepts: dominant manoeuvre, precision engagement, full-dimensional protection, and focused logistics.

The congressionally mandated 1997 Quadrennial Defense Review acknowledged the existence of an RMA and committed the department to transforming the US armed forces. As Secretary of Defense William Cohen put it: 'The information revolution is creating a Revolution in Military Affairs that will fundamentally change the way US forces fight. We must exploit these and other technologies to dominate in battle.'[25] That same year, the congressionally mandated National Defense Panel (NDP) argued even more strongly in favour of the need to transform US forces. The panel's report suggested that an RMA was under way and urged the Defense Department leadership to 'undertake a broad transformation of its military and national security structures, operational concepts and equipment, and . . . key business processes.' The report stated:

> We are on the cusp of a military revolution stimulated by rapid advances in information and information-related technologies. This implies a growing potential to detect, identify, and track far greater numbers of targets over a larger area for a longer time than ever before, and to provide this information much more quickly and effectively than heretofore possible. Those who can exploit these advantages—and thereby dissipate the fog of war—stand to gain significant advantages . . . [the Defense Department] should accord the highest priority to executing a transformation of the US military, starting now.[26]

The United States in the 1990s was not involved in an arms race. Accordingly, discussion of the RMA in the 1990s was not driven by strategic interaction with a

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[24] See, for example, ADM William A. Owens, USN, 'The Emerging System of Systems', *U.S. Naval Institute Proceedings* (May 1995), 35–9.

[25] William S. Cohen, *Report of the Quadrennial Defense Review* (Washington, D.C.: Department of Defense, 1997), iv.

[26] *Transforming Defense: National Security in the 21st Century* (Arlington, Va.: National Defense Panel, December 1997).

prospective adversary.[27] To the contrary, it was fundamentally predicated on opportunity: those who advocated pursuing new capabilities believed that the United States should do so because they would allow it to win wars faster, cheaper, and more decisively. Characteristic of this view was defence analyst James Blaker's statement: 'The potency of the American RMA stems from new military systems that will create, through their interaction, an enormous military disparity between the United States and any opponent. Baldly stated, US military forces will be able to apply military force with dramatically greater efficiency than an opponent, and do so with little risk to US forces.'[28]

Driven by the experience of the Gulf War and the prospect of shorter, more decisive and less costly wars, but not by competition with a potential adversary, the United States embraced precision weaponry in the 1990s. Throughout the decade, the combination of stealth and precision-guided munitions gave US air forces the ability to strike adversaries from the air with near impunity. In addition, airpower seemed uniquely suited to the types of conflicts in which the United States was involved: wars for limited aims, fought with partial means, for marginal interests. Airpower coupled with PGMs appeared to offer the ability to coerce Iraq, intervene in the Balkans, and retaliate against terrorist groups while avoiding the difficult decisions associated with a sustained commitment of ground forces.

Between 1991 and 2003, PGMs grew from a niche capability to represent a new standard of warfare. Whereas 8 per cent of the munitions employed during the Gulf War were guided, 29 per cent of those used over Kosovo eight years later, 60 per cent of those used in Afghanistan ten years later, and 68 per cent of those used in Iraq twelve years later were guided. In Afghanistan, the Joint Direct Attack Munition (JDAM) became the weapon of choice for US forces. Between October 2001 and February 2002, US forces dropped 6,600 of the munitions; during just one ten-minute period on 18 October 2001, the Air Force dropped a hundred of the bombs. Two years later in Iraq, US forces dropped more than 6,500 JDAMs in the march on Baghdad.[29]

The confidence, even hubris, of the 1990s permeated the US officer corps. Officers in the late 1990s perceived the benefits of transformation, but refused to believe that adversaries could acquire precision-strike capabilities themselves. A survey of 1,900 US officers attending professional military education institutions conducted in 2000 found that most tended to believe that the emerging RMA would make it easier for the United States to use force in order to achieve decisive battlefield victories. Most also believed that it would allow the United States to engage in high-intensity operations with substantially reduced risk of casualties and that it would greatly reduce the duration of future conflicts. They also tended to believe that the United States would have a greatly enhanced ability to locate, track, and destroy enemy forces in limited geographic areas.[30] By contrast, these

[27] Alexandra Homolar, 'How to Last Alone at the Top: US Strategic Planning for the Unipolar Era', *The Journal of Strategic Studies* 34/2 (2011), 189–217.

[28] James R. Blaker, 'The American RMA Force: An Alternative to the QDR', *Strategic Review* 25/3(1997), 21–30.

[29] Mahnken, *Technology and the American Way of War*, 200, 209.

[30] Thomas G. Mahnken and James R. FitzSimonds, *The Limits of Transformation: Officer Attitudes Toward the Revolution in Military Affairs* (Newport, R. I.: Naval War College Press, 2003), chapter 6.

same officers were sceptical of the ability of potential adversaries to exploit the precision-strike revolution to harm the United States. For example, only 9 per cent of officers surveyed in 2000 believed that future adversaries would be able to use long-range precision-strike weapons such as ballistic and cruise missiles to destroy fixed military infrastructure, including ports, airfields, and logistical sites; only 12 per cent believed they would be able to use such weapons to attack carrier battle groups at sea.[31]

Phase II: The Emergence of the Anti-Access/Area-Denial Challenge

As noted above, in the early 1990s a handful of defence analysts began hypothesizing about the consequences of the spread of precision strike, stealth, and other new ways of war, including the potential for states to use them in order to develop 'anti-access/area-denial' capabilities. In the event, however, such capabilities took longer to emerge than observers in the 1990s had predicted.[32] To a great extent, the relatively slow diffusion of such capabilities was due to the lack of a strategic competition that would motivate states to acquire new ways of war. Few militaries possessed strategic or operational problems that demanded an unconventional solution. Reinforcing this, at least initially, were the high costs and demanding skills required to develop and deploy precision weaponry.

In the 1990s, however, the barriers to precision warfare dropped, for several reasons. First and foremost was the deployment of the Global Positioning System (GPS) precision navigation and timing (PNT) satellite constellation. The GPS constellation, though tremendously expensive in itself, allowed the United States to deploy precision-guided weapons that were much cheaper than previous generations of command-guided, electro-optical, or laser-guided munitions. Moreover, whereas early generations of precision-guided munitions had required considerable skill to deliver, GPS-guided (or, more accurately, coordinate-seeking) weapons merely required the operator to enter the target's coordinates in the weapon's targeting system, permitting greater accuracy and reliability. Other countries began to deploy their own satellite navigation systems as well, including the Russian Glonass, the European Galileo, and the Chinese Beidou constellations. Second, the increasing availability of high-resolution commercial satellite imagery allowed states (and, increasingly non-state actors, commercial news organizations, and think-tanks) to locate precisely military facilities such as ports and airfields, as well as civilian infrastructure such as factories and power plants. Third, the increasing availability of satellite communications permitted real-time command and control of military forces.

The growth of satellite-based PNT, as well commercial availability of key supporting capabilities, such as imagery and command and control, has allowed a growing number of states and non-state actors to acquire a precision-strike capability. Whereas the development of precision guidance cost the United States

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[31] *Ibid.*, chapter 7.
[32] See, for example, Barry D. Watts, *The Maturing Revolution in Military Affairs* (Washington, D.C.: Center for Strategic and Budgetary Assessments, 2011).

billions of dollars over the course of decades, both states and non-state actors can now strike accurately with a minimum investment.

In most cases, the spread of precision-strike capabilities has been driven by the need to modernize to keep up with current military technology rather than as part of an ongoing arms race. Where strategic interaction appears to come closest to an action-reaction dynamic has to do with China's development of precision-guided conventional ballistic missiles, to include anti-ship ballistic missiles (ASBMs) such as the DF-21D. Unconstrained by the Intermediate-Range Nuclear Forces (INF) Treaty, which prevents the United States and Russia from deploying land-based intermediate-range missiles, China has become the world leader in precision-guided ballistic missiles. According to unclassified Defense Department estimates, China has deployed more than 1,000 precision-guided conventional ballistic missiles opposite Taiwan. The DF-21D and associated sensors and command-and-control systems are credited with the ability to strike ships at sea up to 1,500km from China. Moreover, some analysts believe that China may in the future field a precision-strike system with intercontinental range.[33]

The more closely one examines China's acquisition of such capabilities, however, the more difficult it becomes to discover evidence of a tightly coupled action-reaction arms race.[34] Although Beijing is not strategically autistic, solely paying attention to domestic considerations, internal structures and processes are none the less critical to making decisions on weaponry. This dynamic is illustrated by the advent of precision-guided conventional missiles, including ASBMs.

On one level, Chinese conventionally armed precision-guided ballistic missiles seem to be a response to US power projection based on access to forward air bases and carrier strike groups. However, the situation is more complex. The weapons being fielded now are the result of decisions taken years or decades ago under quite different external and internal conditions. China's precision-guided conventional ballistic missiles, for instance, were not originally intended to threaten bases in Taiwan or the United States. DF-15 SRBMs developed by the China Aerospace Science and Technology Corporation (CASC) and DF-11 SRBMs developed by the China Aerospace Science and Industry Corporation (CASIC) date to the 1980s and began with the effort to counter Soviet deep operations and increase arms exports.

China developed conventional ballistic missiles to counter threats of a deep combined-arms attack by the Soviet Union on its northern border. Missiles were an attractive way to supplement relatively weak capabilities to mount air strikes and rapidly target enemy rear areas. As a result, the Chinese space and missile industry in late 1984 shifted its emphasis from missiles with liquid fuel to missiles with solid fuel, and from weapons with strategic range to weapons with tactical range.[35]

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[33] Mark Stokes, *China's Evolving Conventional Strategic Strike Capability* (Washington, D.C.: Project 2049 Institute, 2009).

[34] The following is drawn from Thomas G. Mahnken, 'Arms Races and Long-Term Competition' in Thomas G. Mahnken and Dan Blumenthal, eds., *Strategy in Asia: The Past, Present, and Future of Regional Security* (Stanford CA, 2014).

[35] Ron Christman, 'Conventional Missions for China's Second Artillery Corps', *Comparative Strategy* 30/3 (2011), 202.

Another rationale for developing conventional ballistic missiles was promoting arms sales to the developing world. Research and development on both DF-15s and DF-11s began in 1985. Active international marketing of DF-15 missiles began in 1986, and Syria agreed to purchase them in 1988. In addition, DF-11 missiles were successfully flight tested in 1990 and a contract for their sale to Pakistan was signed the following year.[36]

In 1988 the People's Liberation Army reached a decision to deploy conventional missiles opposite Taiwan and in 1991 organized a seed unit to accept them.[37] Base 52, the main missile base adjacent to Taiwan, accepted the first DF-15s in 1992. A conventional missile brigade was commissioned the next year and ordered to be operational within a year.[38] Between the mid-1990s and 2010, the conventional SRBM arsenal was enlarged from between thirty and fifty inaccurate missiles to between 1,000 and 1,200 accurate and lethal SRBMs. They included from 350 to 400 DF-15 missiles and from 700 to 750 DF-11 SRBMs.[39]

Turning to the development of the DF-21 ballistic missile and its variants, the link between the influence of the external environment and decisions on military procurement has become more apparent. The development of DF-21D ASBMs would seem to clearly illustrate an action-reaction dynamic. Certainly the available evidence shows that DF-21D development was driven by the requirement to hold US carrier strike groups at bay to deter future intervention. The near-term goal called for keeping carriers at least 2,000km from the coast, beyond the range of carrier-based strike aircraft and Tomahawk land-attack cruise missiles. As one analyst noted, Beijing is 'obsessed with defending China from long-range precision air strikes'.[40] Moreover, pertinent research appears to have begun in 1996 after the Taiwan Strait Crisis. That year the China Aerospace Science and Technology Corporation started ASBM feasibility studies and concept demonstrations, particularly in guidance and control systems.[41]

However, the shape and timing of the programme have also been driven by internal dynamics. The DF-21D is only the most recent variant of the DF-21 missile programme, which began with the fielding of the JL-1 submarine-launched ballistic missile to counter the Soviet threat. Nevertheless, the JL-1 programme revealed deficiencies in defence industries, including missile components such as solid rocket motors, structures, warheads, and re-entry vehicles. The lack of

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[36] Mark A. Stokes and Ian Easton, *Evolving Aerospace Trends in the Asia–Pacific Region: Implications for Stability in the Taiwan Strait and Beyond* (Washington, D.C.: Project 2049 Institute, 27 May 2010), 10; John Wilson Lewis and Hua Di, 'China's Ballistic Missile Programs: Technologies, Strategies, Goals', *International Security* 17/2 (1992), 34–6.

[37] Stokes and Easton, *Aerospace Trends*, 13.

[38] John W. Lewis and Xue Litai, 'Making China's Nuclear War Plan', *Bulletin of the Atomic Scientists* 68/5 (2012), 53.

[39] Michael S. Chase and Andrew S. Erickson, 'A Competitive Strategy with Chinese Characteristics? The Second Artillery's Growing Conventional Forces and Missions', in Thomas G. Mahnken, ed., *Competitive Strategies for the 21st Century: Theory, History, and Practice* (Stanford CA, 2012), 209.

[40] Quoted in Mark A. Stokes, *China's Evolving Conventional Strategic Strike Capability* (Washington, D.C.: Project 2049 Institute, 2009), 6.

[41] Andrew S. Erickson, *Chinese Anti-Ship Ballistic Missile (ASBM) Development: Drivers, Trajectories and Strategic Implications* (Washington, D.C.: Jamestown Foundation, 2013), 41–5.

pressing strategic issues to drive innovation hampered the programme. Specifically, the Chinese remained uncertain about SSBNs armed with medium-range SLBMs because of strategic geography. They doubted submarines could get within firing range of the Soviet Union, and were concerned that the waters around China were too shallow to conceal them.

As a result of Chinese strategic geography and the PLA organizational culture, in the early 1970s the leadership hedged its bets by developing the land-based version of the JL-1 called the DF-21 (CSS-5 Mod-1) MRBM. The two systems were to be developed in tandem with the same airframes and engines. DF-21s were eventually favoured over the sea-based version and entered the operational inventory of the Second Artillery in 1991 with a regional nuclear strike mission, gradually replacing the older liquid-fuelled DF-3A IRBMs.

In keeping with the incremental development process in the aerospace sector, China began the DF-21A (CSS-5 Mod-2) MRBM programme in 1987 to lower structural weight, add propellant, and boost the second-stage thrust to increase the missile's range by 60 per cent. The design work started in 1988 and the initial tests in 1992. DF-21As tested to a 3,000km range and the design was finalized in 1997, with deployment in the late 1990s and 2000s.

DF-21C (CSS-5 Mod-3) precision-guided conventional ballistic missiles became the next system deployed. China became interested in precision-strike technology in the late 1970s and studied the Pershing II, publishing more than fifty articles on the missile's technology. In addition, precision weaponry benefited from the 863 Program, which was established in 1986 to improve nuclear deterrence in the face of US missile defences. China also formed the Precision Guidance Expert Group to focus on terminal guidance, leading to a modernization programme spanning more than four decades that produced DF-21D ASBMs.[42] That the influence of both internal structures and processes is so marked in the case of the DF-21D should give pause to anyone who characterizes Sino-American competition as a single-minded action-reaction arms race.

The Chinese military is not strategically autistic; it pays attention to, and responds to, the external environment. Moreover, China has competed with the United States for two decades while the United States has paid increased attention to China only in more recent years. However, this strategic competition falls short of the type of action-reaction arms race described by international relations theorists. Even though China is clearly building force structures to oppose the United States and its allies, competition with the United States is hardly the sole driver of Beijing's modernization effort.

By the dawn of the new millennium, the spread of precision-strike capabilities and the emergence of anti-access/area-denial capabilities had become a significant concern for the United States. Reflecting this, the 2001 *Quadrennial Defense Review* argued that the Defense Department's transformation efforts should focus on overcoming six emerging strategic and operational challenges:

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[42] *Ibid.*, 8.

- Protecting critical bases of operations, including the US homeland, forces abroad, allies, and friends, and defeating weapons of mass destruction and their means of delivery;
- Assuring information systems in the face of attack and conducting effective information operations;
- Projecting and sustaining US forces in distant anti-access or area-denial environments and defeating anti-access and area-denial threats;
- Denying enemies sanctuary by providing persistent surveillance, tracking, and rapid engagement with high-volume precision strike against critical mobile and fixed targets;
- Enhancing the capability and survivability of space systems and supporting infrastructure; and
- Leveraging information technology and innovative concepts to develop an interoperable, joint [Command, Control, Communication, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR)] architecture and capability that includes a joint operational picture that can be tailored to user needs.[43]

This shift was reflected in officer attitudes. Whereas the vast majority of officers surveyed in 2000 had been unconcerned about the full spectrum of threats, those surveyed in 2002 and 2006 expressed obvious concern about a range of future threats over the next two decades. Officers now worried about the threat from long-range precision-strike missiles with respect to current platforms and deployment schemes, with 69 per cent of officers surveyed in 2002 and 2006 predicting that within a decade, adversaries would be able to use ballistic and cruise missiles to deny the United States the use of ports, airfields, and logistical sites. Similarly, 73 per cent of officers surveyed in 2002 and 68 per cent in 2006 believed that within a decade, adversaries would be able to use such weapons to attack carrier battle groups at sea.[44]

The growth and spread of precision-strike capabilities deviates from the standard model of an arms race, due to the delayed and muted nature of the US response to the growth and spread of precision strike capabilities. Although large majorities of officers expressed increasing awareness of the threat posed by enemies possessing precision-strike capabilities, for the first decade and a half of the twenty-first century US defence planning deemphasized the need to prepare for a war against an advanced adversary. Rather, for the last decade the Defense Department focused on countering insurgency in Iraq and Afghanistan—conflicts where precision strike played a role, to be sure, but not a central one. Moreover, many of the precision-strike systems that the United States employed in these wars, such as armed non-stealthy unmanned air vehicles (UAV) would be unlikely to survive in a more stressful combat environment. Although the Defense Department has indicated its

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[43] *2001 Quadrennial Defense Review Report* (Washington, D.C.: Department of Defense, 2001), 30.

[44] James R. FitzSimonds and Thomas G. Mahnken, 'Officer Attitudes Toward Transformation, 2000–2006', paper presented at the Annual Meeting of the International Studies Association, March 24, 2006, San Diego, California.

desire to shift its focus to the Pacific and the challenge posed by a rising China, it is unclear whether it will have the resources to make rhetoric a reality.

Meanwhile, states are developing the ability to counter US precision-strike capabilities by hardening, concealing, and dispersing their forces and infrastructure. In addition, both states and non-state actors, such as insurgents and terrorists, are seeking to counter US precision-strike capabilities. Insurgents in Afghanistan and Pakistan, for example, have sought to camouflage themselves and hide among the local population. They have also sought to constrain the ability of the United States to bring airpower to bear by falsifying the number of innocents that have been killed in air strikes.[45]

If history is a guide, the future scope and spread of the precision-strike regime will be uneven. The ability of states and non-state actors to deploy an effective precision-strike capability will depend on their ability not only to field weapons, but also to develop or buy the command-and-control, and intelligence-, surveillance-, and reconnaissance-capabilities that are needed to strike with precision, as well as to develop appropriate doctrine and operational concepts for their use. They will also seek ways to circumvent US precision-strike capability.

The most capable states are likely to possess an intercontinental precision-strike capability. The United States is pursuing a Conventional Prompt Global Strike system, and analysts believe that China may be seeking a similar capability. By contrast, short-range precision-strike systems, such as guided rockets, artillery shells, and mortar rounds, are likely to proliferate faster and more widely than long-range systems.

At the strategic level, states and non-state actors alike will be driven to adopt some combination of precision-strike and adaptive countermeasures. At the operational level, the interaction between the development of precision-strike systems, on the one hand, and attempts to protect against them, on the other, will drive the maturation of the precision-strike regime. Precision-guided weapons are putting an expanding range of targets at risk. It is already possible to strike effectively targets that were previously invulnerable. Indeed, precision-guided munitions are increasingly seen as substitutes for nuclear weapons. These trends are likely to continue. At the same time, the emergence of precision-strike systems is already leading adversaries to try to protect targets by making them mobile, as well as by hardening, burying, defending, camouflaging, or concealing them.

Other states may get into the anti-access/area-denial business as well. Iran is developing capabilities to deny the United States access to the Persian Gulf Region.[46] Moreover, Japan appears to be considering the deployment of anti-access capabilities of its own to frustrate Chinese attempts to project power.[47] An anti-access approach would similarly help Taiwan deter Chinese coercion and aggression.[48]

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[45] Brian Glyn Williams, 'The CIA's Covert Predator Drone War in Pakistan, 2004–2010: The History of an Assassination Campaign', *Studies in Conflict and Terrorism* 33/10 (2010), 880–2.

[46] Mark Gunzinger and Christopher Dougherty, *Outside-In: Operating from Range to Defeat Iran's Anti-Access and Area Denial Threats* (Washington, D.C.: Center for Strategic and Budgetary Assessments, 2011).

[47] Toshi Yoshihara, 'Japan's Competitive Strategies at Sea: A Preliminary Assessment' in Mahnken, *Competitive Strategies for the 21st Century*, 219–35.

[48] William S. Murray, 'Revisiting Taiwan's Defense Strategy', *Naval War College Review* 61/3 (2008), 13–38.

Phase III: The US Response to the Anti-Access Challenge

Far from what would be expected in a closely coupled action-reaction arms race, the US response to the growth and spread of precision strike has been slow to come. None the less, the emerging competition between power projection and anti-access capabilities is entering a new phase as the United States seeks responses to the development of anti-access capabilities by China and others.

The 2006 QDR argued that the pace and scope of Chinese military modernization was jeopardizing regional military balances and called for efforts to improve allied military capabilities, diversify the US basing structure in the Pacific, and pursue 'investments that capitalize on enduring US advantages in key strategic and operational areas, such as persistent surveillance and long-range strike, stealth, operational manoeuvre and sustainment of air, sea and ground forces at strategic distances, air dominance and undersea warfare.'[49]

The 2010 QDR further emphasized the need to counter anti-access capabilities. As the report acknowledged:

> Anti-access strategies seek to deny outside countries the ability to project power into a region, thereby allowing aggression or other destabilizing actions to be conducted by the anti-access power. Without dominant U.S. capabilities to project power, the integrity of U.S. alliances and security partnerships could be called into question, reducing U.S. security and influence and increasing the possibility of conflict.[50]

The report also called for the Navy and Air Force to develop a 'joint air–sea battle concept for defeating adversaries across the range of military operations, including adversaries equipped with sophisticated anti-access and area-denial capabilities'.[51]

In the several years that have followed, the US armed services have begun exploring ways to project power into an anti-access/area-denial environment. In August 2011, the Navy and Air Force established the Air–Sea Battle Office to manage the development and implementation of the Air–Sea Battle Concept.[52] In January 2012, the Joint Staff published the Joint Operational Access Concept, which details the use of joint forces to project power in an array of different operational contexts, including power projection that is contested by an adversary.[53] Finally, scholars have posited alternatives to power projection in such an environment, including the use of 'offshore control' or a distant blockade of an adversary equipped with advanced precision strike systems.

Still, the United States and others remain in the early stages of responding to the challenges posed by the growth and spread of precision-strike weaponry.[54] It is a

[49] *Quadrennial Defense Review Report* (Washington, D.C.: Department of Defense, 2006), 29–30.
[50] *Quadrennial Defense Review Report* (Washington, D.C.: Department of Defense, 2010), 31.
[51] *Ibid.*, 31–2.
[52] On Air–Sea Battle, see General Norton A. Schwartz and Admiral Jonathan W. Greenert, 'Air–Sea Battle: Promoting Stability in an Era of Uncertainty', *The American Interest* (March–April 2012); *Air–Sea Battle: Service Collaboration to Address Anti-Access and Area Denial Challenges* (Washington, D.C.: Air Sea Battle Office, May 2013).
[53] *Joint Operational Access Concept*, Version 1.0 (Washington, D.C.: Joint Staff, 17 January 2012).
[54] See Aaron L. Friedberg, *Beyond Air–Sea Battle: The Debate over US Military Strategy in Asia* (Abingdon: Routledge for IISS, 2014).

process likely to continue for decades. Moreover, it is unclear where that competition will end: with the end of the power projection era, with power projection increasingly costly but feasible, or with power projection restored. As with other competitions examined in this volume, its future course will be determined by a mixture of external drivers and domestic conditions.

COMPETITION, BUT NO RACE

A competition is clearly emerging between power projection capabilities, on the one hand, and anti-access capabilities, on the other. This competition coincides with the growth and spread of precision-strike systems. Moreover, it is increasingly fuelling a long-term peacetime competition between the United States and China. The United States is seeking to preserve its ability to project power to defend US territory, protect US allies and friends, maintain free access to the maritime commons and, if necessary, prevent the emergence of a hegemon on the Eurasian continent. China, for its part, seeks the ability to coerce its neighbours while countering the ability of the United States to intervene.

This competition falls short of an arms race, however. Although the United States and China are structuring their armed forces with reference to one another, in neither case is the competitor the sole—or even the main—driver of arms modernization. Moreover, the strategic interaction that is occurring is complex. As noted above, most of the capabilities that have been key to US military effectiveness over the past two decades were developed during the Cold War to meet the requirements of the US–Soviet competition. Similarly, China's conventional ballistic missile force, which today threatens US and allied air bases in the Western Pacific, was developed in response to the prospect of a war with the Soviet Union and the promise of export sales.

Although external developments are shaping the competition, internal developments are influencing its contours. First, the organizational culture of the US and Chinese armed forces are affecting the competition. Power projection is central to the identity of the US Navy, Marine Corps, and Air Force. For China, ballistic missiles are central to the identity of the Second Artillery Force.

Second, bureaucratic politics are influencing the shape of the competition. On the one hand, projecting power and countering anti-access capabilities is one priority among many for the US Defense Department in an era of constrained resources. On the other hand, countering foreign intervention is a top priority for China in a period of budgetary expansion.

In summary, the United States and China are competing with one another in the areas of power projection and anti-access capabilities. However, that competition falls short of an arms race. One could emerge in the future, but it is hardly preordained.

Conclusion

David Stevenson

'intense competition between Powers or groups of Powers, each hoping to achieve an advantage in military power by increasing the quantity or improving the quality of its armaments or armed forces …' Hedley Bull[1]

Arms racing is easier to recognize than to define. But Hedley Bull's phrasing captures the phenomenon's essential characteristics: it is *intense*, going beyond a more routine upgrading; it is *competitive*, being consciously reciprocal and/or reactive; it relates to *quality and/or quantity*; and it embraces a gamut of factors making for military preparedness, even if hardware (*armaments* in the narrow sense) is the most eye-catching and easily measurable element. Although the major instances of such competition have been surprisingly few, they have been central to modern international politics. They provide the framework for an alternative map of the past, distinct from the diplomatic exchanges that form the staple of more conventional international history, even if inextricably bound up with them.

   We asked our contributors to look at what causes and what drives arms races; and at their outcomes, particularly their connection with the outbreak of wars. Under the first heading, the three established patterns of explanation centre on the technological imperative, domestic politics, and action-reaction models. Closer investigation raises doubts about all three, and none is fully satisfactory in its own right, although the balance of relevance between them has differed. Rapid technological evolution is a key development that distinguishes modern armaments competition from similar rivalries before the 1840s. No one state has been able to monopolize any given military technology for long, and in this sense none can control its security environment. All are at risk that unless they innovate, others will pre-empt them. Occasionally technical change has so increased the yields in firepower for a given expenditure that it has actually made the armaments budget cheaper: NATO's and the Warsaw Pact's transitions from bomber- to missile-carried nuclear forces being one leading example, and the advent of GPS-guided munitions being another. But such instances have been exceptional, and in general rapid technological change has not only increased costs and lead times but also fed a prevailing sense of

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[1] Hedley Bull, *The Control of the Arms Race: Disarmament and Arms Control in the Missile Age* (London, 1961), 4.

insecurity, for example during aviation's breakneck advance in the 1930s towards faster speeds, heavier payloads, and longer ranges. None the less, even after big private arms manufacturers emerged in the nineteenth century, the major innovations still emanated from government arsenals, testing grounds, and laboratories. Other governments have some choice about whether to respond to technological challenges, and if so, in what way. Moreover, arms races have frequently occurred between asymmetrical forces: the pre-1914 dreadnought and 1960s ICBM competitions being unusual in involving a common standard of comparison.

Domestic political pressures have often been critical in the origins of major arms contests. Thus, Tirpitz's 1898 and 1900 Navy Laws were not a response to opposing fleet increases but were consciously designed to back up Germany's diplomacy and imperial ambitions, and to apply pressure to Britain. French naval expansion from the 1840s had similar motives. Nazi Germany's build-up after 1933 was likewise not a response to rearmament by prospective enemies but was meant to create the capacity to threaten and to use force in order to overturn the European status quo. Both the Nazi case and the Soviet Union's rearmament after 1927, however, show that the domestic pressures may be ideological and stem from the political leadership rather than from the narrower institutional interests of business and military establishments. Keeping arms industries busy may be a reason for maintaining expenditure (as in the Soviet Union in the 1970s). But in dictatorships as well as democracies, lobbyists for military readiness have vied with pacifist or internationalist critics, and with finance ministries opposed to tax increases and borrowing. When international tension is low—as it was before 1905 among the European continental powers or globally in the 1920s and 1990s—vested interests have failed to prevent stagnation or cuts in spending. Moreover, domestic approaches fail to explain the *simultaneity* of military expansion across different societies that typify major arms races, and which seems hard to account for unless a deteriorating external environment strengthens the arguments within each country for rearmament.

If neither the technological factor nor the domestic politics approach is satisfactory in isolation, nor is the action-reaction model. It is descriptive rather than explanatory, and better at illustrating what sustains an armaments competition than why such competitions begin. Like the technological-imperative model, it may imply that decision makers are automata, whereas in reality they have a range of choice about how to respond to another country's arms increases. It is in shaping the details of such responses that military-industrial complexes may wield their greatest influence. Thus the NATO leaders did not have to counter the Soviet SS-20 deployment (though they feared serious consequences if they did not), but the deployment option they selected (especially that of Pershing IIs) arguably shifted the military balance more drastically than had the Soviet initiative; though it may be countered that the Soviets too had done more than simply upgrade their SS-4s and SS-5s. But it enhances the model's explanatory value if we establish what kinds of external developments have initiated action-reaction cycles. Diplomatic crises (particularly *sequences* of them) and localized wars have frequently served as catalysts: thus the 1896 Kruger Telegram affair helped crystallize Germany's

decision for a naval build-up against Britain;[2] the 1908–9 Bosnian crisis, the 1911 Agadir crisis, and the 1912–13 First Balkan War accelerated pre-1914 land rearmament;[3] and the 1938 Sudetenland crisis stepped up Britain's, France's, the Soviet Union's, and the US's response to Nazi Germany.[4] In contrast the Soviet–American Cold War arms race emerged more slowly from both sides' insecurities in the late 1940s, but crossed a threshold when the first Soviet atomic bomb test and North Korea's invasion of the South prompted America's H-Bomb decision and massive US conventional and nuclear rearmament (defence outlays tripling in 1950–1), which the Eastern bloc soon followed. In the mid-1970s a run of Third World crises (in Angola, the Ogaden, Cuba, and Afghanistan) helped engender a new American build-up under Presidents Carter and Reagan; and the 1991 Gulf War, 1995 Taiwan Straits crisis, and 1999 Kosovo War may have been pivotal for post-Cold War Russia and China. Sudden and unexpected shifts in the wider (not just military) balance of power may have similar consequences—the formation of the North German Confederation in 1867 and tsarist Russia's recovery from defeat by Japan in 1905 being cases in point. Broadly speaking, underlying political antagonisms have generated decisions for competitive rearmament, but the pace and timing of that rearmament may then become an independent variable that further heightens the antagonism (the 1955 Czech–Egyptian deal or the 1962 Soviet decision to deploy missiles in Cuba are good examples of this phenomenon). On the other hand, arms competition can make both sides more cautious (as with both the Soviets and the Americans by the Cold War's later stages), although it is unlikely that military rivalry can be controlled unless the sources of political tension are addressed in conjunction with it, or diminish in severity for other reasons.

We also asked our contributors to comment on how arms races end. Although a number of arms races have terminated in war, they have not invariably (or inevitably) done so. On the contrary, they may end through agreement (tacit or explicit), exhaustion, or diversion to some other armaments competition, or through several such factors in combination. Moreover, whereas nineteenth-century efforts to limit armaments through diplomacy were almost uniformly ineffective, during the twentieth century arms control agreements became significant. Already after 1912 the Anglo-German naval race began stabilizing on the basis of an approximately 3:2 capital-ship ratio that both sides could live with, even if they never incorporated it into a formal compact. In contrast the 1921–2 Washington Treaties did manage for a decade to take the impetus out of Anglo-American-Japanese

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[2] German Emperor Wilhelm II congratulated the President of the Transvaal, Paul Kruger, on repelling an attempted invasion (the Jameson raid) by irregular forces from the British Cape Colony. The telegram caused indignation in Britain, where the government constituted a special naval 'flying squadron', and the Germans took no further action.

[3] David Stevenson, 'Militarization and Diplomacy in Europe before 1914', *International Security*, 22/1 (1997), 125–61. Paul D. Senese and John A. Vasquez in *The Steps to War: An Empirical Study* (Princeton NJ, 2008) argue that states tend to adopt realist practices such as arms racing, coercive diplomacy, and alliance building when war seems to them more likely, thereby indeed rendering hostilities more probable.

[4] Joseph A. Maiolo, *Cry Havoc: How The Arms Race Drove The World To War, 1931–1941* (New York, 2011), 269–313.

naval rivalry. It helped that all three countries had just fought a war (though America and Japan had been relatively undamaged by it), that all knew the likely outcome of an all-out competition would be American predominance, that all (including the Americans) wanted to save money, and that the issue could be addressed as part of a package deal attending not only to capital ship tonnages but also to bases, China, and the structure of Pacific alliances. Unusually, a deal could for a time give something to everyone; though it is therefore possible to argue (as with the 1972 SALT I and ABM treaties) that arms control agreements merely ratified a benign status quo. This judgement seems overly pessimistic, however, and the treaties did have an independently pacifying effect, though the underlying sources of political tension soon re-emerged. In the case of the post-Cold War arms control agreements, in contrast (TNF, CFE, and START I), which taken together mark the most radical such package yet signed, it is more obvious that the arms control agreements accompanied and built upon a political transformation.

Both the Anglo-German naval race and the Cold War raise the question of whether an arms race can end with one side 'winning'. At least in the former case, the answer seems to be yes. In answer to Tirpitz, the British redeployed their warships, tightened co-operation with Germany's enemies, heightened naval readiness, and built faster, more heavily armed, and costlier battleships. This 'plunging', as Admiral Fisher called it, proved more than the Germans could equal, and in the winter of 1911–12 they dropped back from laying down four new capital ships a year to two. The British benefited from their bigger shipbuilding industry (one portion of British manufacturing that had continued to thrive) and the resilience of their public finances, buoyed up by David Lloyd George's tax increases in his 1909 'People's Budget'. The Germans had more rigid fiscal arrangements and the cost of racing caused a financial crisis, the more serious as by 1912 they felt increasingly vulnerable on land. In this sense the outcome was indeed a British 'victory', albeit partly due to Germany's armaments efforts being redirected, and on both counts it resembled the outcome of the mid-nineteenth-century Anglo-French rivalry as well as that between Britain, France, and Russia in 1884–1904. Even so, the British paid a diplomatic and financial price for their success, and as Matthew Seligmann argues, being outbuilt by his adversary may have encouraged Tirpitz to welcome the First World War, despite his being marginalized by the German military and political authorities during the July 1914 crisis.

The endgame in the Soviet–American arms race in the 1980s had some similar features, although here the element of financial crisis was greater and Soviet diversion insignificant. Although the numbers of American atomic warheads and delivery systems peaked earlier, in the late 1970s and early 1980s the Americans made major gains in accuracy. At the same time they began redressing the military balance in Central Europe, which had long favoured the Warsaw Pact. Both American and Soviet assessments suggested that the advantage in strategic systems and in the European theatre was moving to the West, even without the more speculative benefits promised by the Strategic Defense Initiative. Hence it was in Mikhail Gorbachev's interest to halt the rivalry, and to eliminate the Pershing II missiles by diplomatic means. He began by seeking greater manoeuvrability in the

Cold War confrontation, rather than winding it down altogether. But after 1988, not least due to the consequences of his unilateral force withdrawals from Central Europe, the disengagement process escaped from his control. Like the British earlier, the Americans had capitalized on their prowess in military research and development (even as their broader manufacturing capability entered relative decline): and although—unlike the British—they financed the Reagan budget deficits by borrowing, they commanded the necessary financial credibility. These advantages may be less apparent in future contests, and future adversaries less willing than was Gorbachev to concede gracefully.

Not all arms races have ended so benignly, although their role in causing wars has been misunderstood. Perhaps the most direct connection was with the pre-1914 European land arms race, even though neither the Russian military reorganization of 1910 nor the German army laws of 1912 and 1913 seem to have been intended to start a European conflict. The Russians' reorganization was linked to a defensive concentration plan (Plan 19), and was meant to assist in responding to threats in Asia as well as in Europe. They may have underestimated how challenging it would appear in Vienna and Berlin. The Germans' measures of 1912 and 1913 were supposed to redress a balance that was altering against them and to maintain the viability of what in contrast was indeed an offensive concentration plan, but they were not thereby committed to launch a preventive war, even if this option increasingly tempted them. In 1914, however, the state of the armaments balance encouraged brinkmanship on both sides, the German political chiefs having been briefed that the chances now for victory were reasonably favourable but by 1917–18 they would not be; whereas the French advised the Russians that the military situation had much improved and they had less need to back down. The land armaments race was approaching, or thought to be approaching, a cross-over point, at which one side might overhaul the other; and this goes far to explain the war's *timing*. Indeed in 1870 too both sides had believed the military prospects were favourable, again following an upsurge of armaments spending, but in that case the French had been mistaken. This underlines the truism that perceptions rather than the reality of the military balance most influence decisions for war, even if the reality matters more once fighting has started.

The 1930s may seem simpler. Adolf Hitler viewed wars not just as a means to an end but also as being good in themselves, and from the moment of becoming German Chancellor he meant to fight one. The conflict he envisaged, however, was against the Soviet Union rather than the Western Powers, and he hoped at first for Britain's (if not France's) co-operation. Once it seemed the British would resist him the picture changed, and between 1936 and 1939 it is accurate to speak of a German/Franco-British armaments race. Neville Chamberlain, first as Chancellor of the Exchequer and then as Premier, hesitated, fearing that military spending would derail Britain's fragile recovery from the Great Depression and start an uncontrollable drift towards hostilities, but especially after the Sudetenland crisis he took his foot off the brake. By 1939 Hitler feared that the advantage he had gained by starting early was dissipating; whereas the British (and to a lesser extent the French) could risk hostilities with greater confidence. The military balance

might move still further in their favour as their build-up continued, but the economic—and especially balance of payments—burden would soon become unsustainable. Once again, therefore, although the roots of conflict between Nazi Germany and the Western Powers ran wider and deeper, the development of the armaments competition between them made both sides more willing to run risks and influenced the timing of hostilities.

In 1870, 1914, and 1939 war came when the arms race appeared to both sides to be approaching convergence. What counted was less armaments competition as such than the specific conjuncture that the competition had reached. Similarly in December 1941 the Japanese may have favoured attacking the United States before the Roosevelt administration's naval programme developed further: although in this case the role of the armaments balance seems to have been less salient. It is true that the type of war that the weapons were thought to make possible also mattered. In 1870 Bismarck had good reason to expect a rapid success; by the late 1880s, instructed by the Elder Moltke's forebodings, he had little ground for doing so. In 1914 it still seems that the political leaders on both sides supposed the advantage lay with the offensive, even if many military professionals doubted that the campaigning would be brief. In 1939 Hitler hoped the Western Powers would not declare war at all, or if they did that they would make peace once Poland was defeated; whereas the French and British knew that their preparations had progressed since the Munich agreement and rightly supposed the German economy to be overstretched. However, the essential point remains that in 1870, 1914, and 1939 both sides believed the arms race was moving towards a crossover point; and although in principle a more equal balance should have deterred both from fighting, in reality a dynamic or unstable balance may actually have encouraged both to take the plunge. In contrast, the Germans never overcame Britain's superiority in the pre-1914 naval race, and the phase when they came closest, after 1908, was soon ended by a British building surge. This critical transition, when technological innovation had seemed to open up a chance to eliminate Britain's lead, bears comparison with the missile revolution of the late 1950s and early 1960s when the US and Soviet Union were introducing ICBM and SLBM deterrents alongside their fleets of long-range bombers, in which latter category the US had held the advantage. The Soviets seemed briefly to gain the lead in the emerging missile race, albeit partly because the Eisenhower administration had opted for more durable systems (the Minuteman and Polaris) that would take longer to come on stream. By 1962, in contrast, the Americans were moving rapidly ahead in deploying the new technologies, and it was no coincidence that at this point, in the Cuban Missile crisis, Khrushchev attempted to forestall them by positioning medium- and intermediate-range rockets in the Caribbean. That he failed condemned the Soviets to a slower and costlier ICBM programme based in their homeland, and the Americans retained the edge, the USSR's numerical lead in ICBMs by the later 1970s being soon once more offset by more accurate American systems. As in the Anglo-German naval race, therefore, the leader was never overhauled. In this sense both competitions were conducted within a framework of underlying stability, which was reinforced by the caution impelled by thermonuclear

weapons' awesome destructiveness. If in 1914 and even 1939 it was still conceivable that all-out hostilities might be a rational procedure for countering insecurity and gaining political advantage, by the 1960s such thinking was fantastic, even if in Cuba and China it still had its adherents. That being said, it also mattered that the Cold War contest featured two states that had both been victors in 1945 and both had interests (albeit unequally) in maintaining the global status quo—indeed both became overstretched. Other considerations besides armaments, in other words, helped keep the Cold War cold.

Away from Washington and Moscow, conventional (or primarily conventional) arms races continued through the Cold War period, most notably in the Middle East and South Asia. In both regions the costliest and most sophisticated weapons were imported, and sooner or later needed paying for in foreign exchange. In this respect these races resembled those outside Europe before 1914 and between the wars, and the additional financial demands might have acted—though in practice did not—as a constraint. In fact, according to Rudra Chaudhuri's chapter, the 1965 Indo-Pakistan War was largely unrelated to the military balance, and India already so much better armed that it made little sense for Pakistan to challenge it, the conflict arising from a limited military incursion and the Pakistanis' under-estimation of the Indian reaction. Indeed the most violent phase of the Indo-Pakistani antagonism (including three wars) occurred before both sides obtained nuclear weapons, and it might be argued that in this arena too the possession of the Bomb has imposed caution. It is also doubtful, however, if a crossover point was ever close to being reached, and since the 1970s India has commandingly widened its lead.

In contrast, in the Arab–Israeli conflict, only one side possessed nuclear forces, but did not acknowledge doing so, despite repeated high-intensity conventional conflicts. Between the 1940s and the 1970s, in fact, the Arab–Israeli arms race ex-hibited significant similarities with armaments politics in pre-Cold War Europe. Even though throughout the period the Israelis retained their advantage, the 1955 Soviet/Czech arms deal with Egypt threatened to overturn it and created a powerful incentive to strike pre-emptively. Soviet arms deliveries to the Arab countries may have had similar effects before 1967; whereas in 1973 they encouraged Egypt and Syria to open hostilities. Avi Kober contends that Israel's further build-up after 1973 (in conjunction with developments such as the Egypt-Israel peace agree-ment) finally deterred the Arab states from further conventional wars, and in this sense after thirty years of confrontation Israel finally 'won'. In contrast the timing of more recent low-intensity conflicts between Israel on the one hand and Hizbollah and Hamas on the other has been less related to developments in the arms race, although an asymmetrical contest has indeed pitted Hizbollah's and Hamas's rockets against Israel's air defence systems, and so far Israel has continued to main-tain its advantage.

It was contended above that retracing armaments history can offer an alternative map of the past, illuminating deeper patterns of alignment and antagonism that the minutiae of day to day diplomacy may obscure. The underlying armaments history of the post-Cold War period is now coming into sharper focus, and in

many ways the picture is disquieting.[5] After the break-up of the Warsaw Pact and of the Soviet Union the United States enjoyed a decade-long peace dividend, reducing its real defence spending by some 40 per cent, before the 9/11 terror attacks and the Afghanistan and Iraq wars produced a new upward trend. Concealed behind the formidable expense of the 'War on Terror', however, has been an intensifying competition with China, which began before 2001, and which the Obama administration's 'pivot to Asia' has highlighted. On the Chinese side, conversely, the pattern has been of continuing and escalating expenditure growth since the 1980s, the pace intensifying after 1999, and again after 2010, to the point where the total may now be about one-third that for the US, and warship numbers may already be approximately equal—although in ship-for-ship performance the US remains superior. Moreover, as Tai Ming Cheung points out, Japan in 2014 began raising its defence spending, with China the main target, and India's relationship with the PRC is taking on some arms race characteristics. In Europe, the Soviet/ Russian defence budget collapsed after 1991 but rallied after the 1997 ruble crisis, the 1999 Kosovo War, and the advent to power first as president, then as premier, and then again as president, of Vladimir Putin. In contrast, British expenditure, like American, fell during the 1990s before rising due to Iraq and Afghanistan, and falling again after the 2008 financial crisis, whereas defence expenditures in France, Germany, and Italy have remained below Cold War levels. Projections in these matters are notoriously unreliable, and the recent check to China's and Russia's economic growth may slow their trajectory and prolong Western superiority. Moreover, current ratios of defence expenditure to gross domestic product remain below the peaks reached in the 1930s and the acutest phases of the Cold War. None the less, the progress made in military modernization may well have contributed to recent Chinese and Russian diplomatic assertiveness, which naval and military deployments have supported. If the trend continues it is likely, after the 2016 US presidential election if not before, to generate pressure for American rearmament directed less towards Middle Eastern interventions than against Washington's Great Power rivals. At that point we could stand on the brink of another full-scale arms race, in which the US and its partners will be handicapped by atrophied manufacturing capacity and swollen international indebtedness. It is less clear that either China or Russia—particularly the latter—are status quo powers in the sense that was true for the Soviet Union, and recent technological developments may have eroded the conventional/nuclear force distinction and weakened the obstacle to military conflict formerly presented by the fear of escalation. Indeed, the phenomenal spread of information technology and the concomitant development of cyber warfare raises the possibility that in future hostilities advanced societies could be reduced to chaos without a shot being fired.

We return to the often-posited conflict between 'deterrence' and 'spiral' interpretations of the effects of armaments expansion. Is armaments competition (as Lord Grey warned) inherently destabilizing, an independent technical variable that can intensify inter-state antagonism, quite apart from political sources of

[5] See Figure 12.1 for post-Cold War military spending.

international rivalry? Or is the lesson from the 1930s experience that Britain and France should have rearmed faster and earlier in order to deter aggression? Did American administrations from Truman to Reagan infer correctly that vigorous armaments policies could render military conflict less likely? The answer to the latter question is probably 'yes' (and new evidence from the Soviet side now confirms this view), at any rate after the dangerous transition of the early 1960s had been negotiated and both sides acquired secure second-strike capabilities and satellite monitoring systems. The answer to the second may well be 'no', since both Britain and France premised their strategies on deterring Germany through the threat of a long conflict that it could not win, and the only plausible counterfactual method by which a major war might have been prevented was military intervention before Hitler's rearmament got under way. But the broader theoretical point is more complex and ambiguous, and the binary divide too simplistic. It may well be that arms races can actually have both spiral and deterrence effects, or pass through successive, more and less dangerous, phases. A decision to initiate an armaments competition—or to respond to another power's initiative—may bring political advantages, but probably alongside unforeseen and unintended consequences. The practical imperative for the United States now is to avoid a situation where its very far-reaching security obligations in Europe and East Asia become militarily challenged, thus forcing it to choose between resorting to armed conflict and reneging on treaty commitments. For this purpose it will need to steer an extraordinarily difficult course that maintains the military credibility of its guarantees, while avoiding an escalation of tension that increases rather than diminishes the possibility of an armed confrontation that would be calamitous for all concerned. After the American 'unipolar' predominance in the 1990s and the preoccupation with international terrorism in the 2000s, the spectre of great-power tension and even all-out warfare is forcing its way back onto the international agenda. Historical study can help provide a framework, and a basis of experience and insight, to help in thinking about this dangerous world, but it cannot substitute for informed analysis of the present that rests both on technical understanding of the military capabilities and a political understanding based on careful observation (and mastery of the languages and cultures) of all the players. Such expertise used to be plentifully in evidence in Western societies for their leaders and policymakers to draw on; and this volume is offered, at one level, as a modest step towards replenishing it. But above all, like others who write about these matters, we do so in the aspiration that the weapons should never be used in anger again.

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