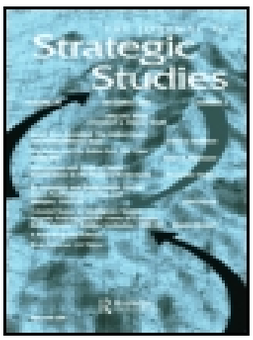

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The 'bomber gap': British intelligence and an American delusion

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ABSTRACT

For most of the 1950s, manned aircraft were the prime nuclear bomb delivery method, and were therefore a vital metric for British and American intelligence when calculating the Soviet threat. Each community reached very different conclusions from the same raw intelligence, generating the 'bomber gap' myth in the US but not in the UK. The information available was inconclusive, so in order to understand it estimators had to rely on their assumptions, which were different. Contrasting scopes for parochial capitalisation drew their conclusions further apart. Contrary to orthodox accounts of this episode, Soviet deception did not play a central role.

KEYWORDS Intelligence; analysis; deception; aviation; USSR

Introduction

On 29 August 1949, the Soviet Union set off its first nuclear explosion. The political and security ramifications were most acute for the US, the USSR's main adversary, and the UK, the ally closest to America's side in the emerging bipolar order. America and Britain now faced a new destructive power, the swiftness and severity of which was truly unprecedented. But the Soviet threat of nuclear obliteration was only as good as its ability to deliver these weapons to their targets. By the end of the 1950s, the ballistic missile would become and remain the dominant Soviet delivery vehicle,[1] but during the intervening years manned bomber aircraft were the prime method by which to convey a nuclear bomb to its target. They were consequently a vital metric in calculating the overall Soviet threat.

The significance of Soviet bombers to national security in this era was recognised by the UK and the US intelligence organs. By 1954 the American Office of National Estimates (ONE) held that 'the USSR's highest capability lies

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[1]Steven J Zaloga, *The Kremlin's Nuclear Sword: The Rise and Fall of Russia's Strategic Nuclear Forces, 1945–2000* (Washington, DC: Smithsonian Books 2002), 54–59.

in … nuclear weapons delivered by long-range aircraft', which at that time were 'medium [and] heavy bombers'.[2] Correspondingly the British Joint Intelligence Committee (JIC) viewed that in the event of nuclear war, Soviet leaders would give the 'highest priority' to 'strategic air operations' conducted by 'heavy and medium bombers'.[3] The JIC and ONE drew together the work of their respective intelligence communities to produce regular national estimates of Soviet bomber strength. American and British estimates are notable because of the contrast in accuracy. In the US, erroneous estimates drove public fears about a so-called 'bomber gap', as well as large increases in defence procurement.[4] This phenomenon did not take place in Britain. As Richard Aldrich notes, London and Washington, typically the firmest of partners, were 'adversaries' on this matter.[5] British bomber intelligence, however, has received comparatively little attention in the academic literature, leaving the explanation for its superior quality incomplete.[6]

This paper examines British bomber estimates alongside their American counterparts, and weighs their accuracy through comparison to the USSR's actual bomber strength, which has been catalogued by a number of authoritative studies.[7] American estimates are found to have been inaccurate because they were based on flawed assumptions, the impact of which was magnified by the Air Force's pursuit of its parochial interests. British estimates avoided these pitfalls and achieved a greater degree of accuracy because more realistic assumptions were held, and the opportunity for such lucrative parochial exploitation was absent.

Bomber intelligence sources

Why should British and American intelligence estimates of the Soviet bomber threat *not* have been different? They were, after all, produced by different

[2][http://www.foia.cia.gov, 24 Apr. 2016] SNIE 11–2-54, ['Soviet Capabilities for Attack on the US through 1957', 24 Feb. 1954].

[3][Kew, United Kingdom, The National Archives] CAB[inet office papers) 158/19 JIC(55)7(Final), ['The Soviet Strategic Air Plan in the Early Stages of a General War in the Period up to 1959', 16 Feb. 1955].

[4]Lawrence Freedman, *U.S. Intelligence and the Soviet Strategic Threat* (Princeton: Princeton University Press 1986), 62–67; Fred Kaplan, *The Wizards of Armageddon* (Stanford: Stanford University Press 1991), 155–61; John Prados, *The Soviet Estimate* (Princeton: Princeton University Press 1986) Ch. 4.

[5]Richard J Aldrich, *The Hidden Hand: Britain, America and Cold War Secret Intelligence* (London: John Murray 2002), 551.

[6]The matter is briefly examined in Michael Goodman, *Spying on the Nuclear Bear: Anglo-American Intelligence and the Soviet Bomb* (Stanford: Stanford University Press 2007) Ch. 6, and his *The Official History of the Joint Intelligence Committee, Volume I: From the Approach of the Second World War to the Suez Crisis*. (Oxon: Routledge 2014), 287–290. The Joint Intelligence Bureau's work on the subject is elucidated in Huw Dylan, *Defence Intelligence and the Cold War: Britain's Joint Intelligence Bureau 1945–1964* (Oxon: Oxford University Press 2015), 126–136. Otherwise Britain's bomber estimates are only mentioned in passing, such as Aldrich, *Hidden Hand*, 551 & Huw Dylan, 'Britain and the Missile Gap: British Estimates on the Soviet Ballistic Missile Threat, 1957–61', *Intelligence and International Security*, 23/6 (2008), 778.

[7]Zaloga, *Nuclear Sword*; Timur Kadyshev, 'Strategic Aviation', in Pavel Podvig (ed.), *Russian Strategic Nuclear Forces* (London: The MIT Press 2001).

personnel, who worked in different intelligence organisations, which operated in different political environments. But when one looks at the unprocessed information on which these estimates were based, it appears to have been substantively or exactly the same for both the UK and the US. This is because there was an extraordinary level of sharing and joint collection of intelligence taking place. As H. Bradford Westerfield observed, 'no intelligence collaboration between major countries has ever been so stable, so longlasting, so nearly comprehensive, and so nearly co-equal as that between the US and the UK'.[8] The existence of liaison arrangements specifically relating to bombers underlines their particular importance, such as one example which was set up in 1950, between the United States Air Force (USAF) and the British Air Ministry.[9] The scope for such divergent conclusions to be reached in British and American estimates therefore rested on the inconclusiveness of the initial raw intelligence, which was meagre enough to allow for wide variances in interpretation to subsequently be made.

Inconclusiveness was guaranteed by the prevalence of two deficiencies: absence and partiality. Absence of valuable information was inherent to the nature of the USSR as an intelligence target. Heavy restriction and monitoring of travel, communication, and association made espionage extremely difficult, and severe punishments for those caught engaging in the activity made it especially dangerous. An attenuated flow of information was therefore inevitable. Soviet security measures were a constant source of frustration for the intelligence alliance. Endeavours were made to develop new sources and improve those already in use, but many of these attempts failed, and those that succeeded did not reach fruition until the end of the bomber's supremacy as a delivery system. Furthermore, although aircraft are conspicuous intelligence targets, this does not translate directly into greater quality of intelligence, only quantity. It is here that the second deficiency, partiality, comes into play. Fully aware of the attention their aircraft drew, Soviet leaders were careful to avoid situations in which secrets might be unintentionally revealed.

Humint, when at its best, can provide the most valuable information: insights into leaders' thinking. But efforts in this collection discipline were far from optimal during this period. Attempts by Western operatives to infiltrate the USSR were utterly unsuccessful, as operatives were identified, captured, and then turned or neutralised with extreme proficiency by the Soviet security services. Further away from the centre of Soviet power, in Central and Eastern Europe, the pickings were less slim. Rather than having to infiltrate their own personnel, Western agencies could exploit the many natives who offered their services, but here the problem was not so much

[8]H. Bradford Westerfield, 'America and the World of Intelligence Liaison', *Intelligence and National Security*, 11/3 (1996), 528.

[9][http://gateway.proquest.com, 24 Apr. 2016] 'USAF-RAF Agreement on Target Intelligence', c.1950.

quantity but quality. Former CIA officer William Hood colourfully describes those offering their services as a 'horde of tricksters'.[10] This proved a constant frustration for SIS, which had a complete 'inability during the fifties to … recruit sources in the Kremlin, Red Army, or security services', as Stephen Dorril shows.[11] The CIA was a little more fortunate, thanks to Pyotr Popov of the GRU (Soviet military intelligence). He was significant as the first Soviet official reporting to a Western intelligence agency, in 1952.[12] From then until his exposure in 1958 he was, in Christopher Andrew's view, the CIA's most important agent.[13] Though he may have come across snippets of relevant information; however, it is very unlikely that any significant volume of bomber intelligence could be accrued from the chance hearings of a single, troubled man, who was also tasked with gleaning intelligence on many other matters. Second in utility to spies are defectors. The most promising was Lieutenant Colonel Gregory Tokaev, who had worked in the Air Force Department of the Soviet Military Administration in Germany. Although the provenance of his information has now been shown to be dubious,[14] the British Air Ministry still considered him to have 'furnished valuable intelligence' to them.[15] Even so, there is a fundamental drawback to this type of source, since their information becomes increasingly dated from the moment of their defection. Tokaev was no exception; after a few months of dialogue, his interrogators recorded in June 1948 that he 'has been exhausted as a source of intelligence'.[16] By this point, so too were defectors in general.[17] A sizeable Humint collection effort went into the Anglo-American interrogation of German ex-prisoners of war (PoW) returning from the USSR. The American side of the operation yielded such insights as flight test data on new aircraft.[18] It enabled the British to map Soviet aircraft factories and airfields, which could be used to calculate production rates. In 1949, the JIC had identified 34 of the former and 224 of the latter, based substantially on this intelligence.[19] However the number of these

[10]William Hood, *Mole: The True Story of the First Russian Spy to Become an American Counterspy* (London: Brassey's US 1982), 34.
[11]Stephen Dorril, *MI6: Fifty Years of Special Operations* (London: Fourth Estate 2001), 518.
[12]John Ranelagh, *The Agency: The Rise and Decline of the CIA* (New York: Simon & Schuster 1987), 255.
[13]Christopher Andrew, *For the President's Eyes Only: Secret Intelligence and the American Presidency from Washington to Bush* (New York: HarperCollins 1996), 214.
[14]Paul Maddrell, *Spying on Science: Western Intelligence in Divided Germany 1945–61* (Oxford: Oxford University Press 2006), 70–71.
[15][Kew, United Kingdom, The National Archives] FO[reign Office papers] 1093/548, Hayter & Warner, 'EXCISE', [Memorandum, 22 Jun. 1948].
[16][Kew, United Kingdom, The National Archives] FO[reign Office papers] 1093/548, Hayter, Halford, Lambert, and Risdale, 12 June 1948. 'EXCISE', [Memorandum, 12 June 1948].
[17]Dorril, *MI6*, 148.
[18]James Erdman, 'The Wringer in Postwar Germany', in Daniel M. Smith, Clifford L. Egan, and Alexander W. Knott (eds.), *Essays in Twentieth Century American Diplomatic History Dedicated to Professor Daniel M. Smith* (Washington, DC: University Press of America 1982), 178.
[19][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 158/5 JIC(48)116(Final), ['The Use of Atomic Bombs in a War against the Soviet Union', 4 August 1949].

men was finite, and by 1952 it was felt by those running the operation that all who were 'worth the effort' had been interrogated.[20]

Officials stationed abroad could easily collect information on aircraft that the Soviets intentionally showed them. As Lawrence Freedman notes, 'the main opportunity came with military parades, which were not infrequent, and were often used by Soviet military leaders to show off their hardware'.[21] As well as reporting what they had seen, Western staff collected data which could be analysed in more depth later on, such as audio recordings of their engines.[22] These opportunities evidently provided a large amount of useful information, but like Osint publications that were also monitored, they were bound by the inherent restraint of Soviet control, precluding access to secrets. The British Air Attaché in Moscow ruefully summarised the situation in 1952, writing that '[s]uch a vast expanse of the Soviet Union remains forbidden to Western diplomats and attachés, that it is an easy matter for the Russians to keep their latest developments from foreign eyes'.[23]

Although Sigint was abundant, in both its Comint and Elint forms it did not manage to penetrate deep enough where it mattered most. The Soviet long-range bomber force had been formally designated a top signals priority by the JIC in 1948,[24] but this effort hit a deep rut 5 months later. On 'Black Friday', new Soviet security measures drew to a halt the interception and reading of the significant quantity of communications traffic which had, until that point, been possible.[25] GCHQ's subsequent Comint output largely covered lower-priority and less target-specific topics such as Soviet manufacturing and logistics, and eventual British workarounds were not fully operational until the late 1950s.[26] 'Black Friday' placed the same barriers before the Americans.[27] As the years went by progress was made on Comint, with the newly-formed US National Security Agency, for instance, appearing to have penetrated the Soviet national civil defence network by 1954.[28] This allowed it to gather some information on subjects including military aircraft production, but it would still take time to

[20][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 176/34 JIC/392/52, ['Interrogation of German P.O.W.', 12 February 1952].
[21]Freedman, *U.S. Intelligence*, 65.
[22][http://gateway.proquest.com, 24 Apr. 2016] CIA Office of Research and Reports to Assistant Director (CIA Office of Research and Reports), ['Moscow May Day Air Show', 5 May 1954].
[23][Kew, United Kingdom, The National Archives] FO[reign Office papers] 371/100874, J. C. A. Johnson to Sir Alvary Gascoigne, ['Quarterly Report for the Period 1st July–30th September 1952 – Air Attache, Moscow', 30 October 1952].
[24]JIC(48)19(0)(2nd revised Draft), 'Sigint Requirements – 1948', 11 May 1948. Reproduced in Richard Aldrich, Rory Cormac, Michael Goodman, Spying on the World (Edinburgh: Edinburgh University Press 2014) Ch. 6.
[25][http://www.nsa.gov, 24 April 2016] National Cryptological School. On Watch: [Profiles from the National Security Agency's Past 40 Years. No date].
[26]Richard J. Aldrich, *GCHQ: The Uncensored Story of Britain's Most Secret Intelligence Agency* (London: Harper Press 2010), 108.
[27]Matthew M. Aid, *The Secret Sentry: The Untold History of the National Security Agency* (New York: Bloomsbury Press 2010), 46.
[28]Matthew M. Aid, 'The National Security Agency and the Cold War', *Intelligence and National Security*, 16/1 (2001), 40.

build the case[29]; meanwhile the US overestimation flourished. As for Elint, this was an area of especially close US–UK collaboration,[30] and by monitoring sources such as radar systems, it was possible to ascertain relevant information relating to the quality and quantity of Soviet aircraft.[31] Nonetheless, while both Comint and Elint were gradually able to build a picture of the USSR's bomber force as it stood at that time, the highest level Sigint which could have offered insight into the crucial subject of future production plans remained largely out of reach.

Imint was voluminous, but like other collection disciplines it fell short of penetrating the most important targets. Many of the human sources discussed above were able to capture photographs and motion pictures of Soviet aircraft, airfields, and aviation factories when nearby. However, Imint gathered in this way still suffered from the fundamental limitations that frustrated contemporary Humint operations. To circumvent the heavy restriction of access, overhead photography was necessary. Many missions of this kind were staged, but the costs far outweighed the rewards. Conventional reconnaissance aeroplanes were perilously vulnerable to interception by Soviet fighters. In the opening decades of the Cold War at least 252 men were shot down, killed or imprisoned, and not a single mission made it deep enough into Soviet territory to photograph a strategic installation.[32] This remained so until the high-altitude Lockheed Martin U-2 came into operation, yet its first flight over the USSR was not until July 1956, and it was still some time before substantial coverage was gathered, too late to fill the Imint dearth.[33] To overcome the problem of crew vulnerability, endeavours were made with unmanned aircraft. Camera-equipped balloons were launched which, while innovative, were dismally ineffective.[34]

Across all collection disciplines, despite intensive efforts, yields were severely lacking in one way or another. It was frequently the case that insightful sources were drying up by the early 1950s, such as Comint interception or German PoW interrogation. It was not until the late 1950s that these hurdles were finally surmounted, with the genesis of collection systems like the U-2, by which point the bomber's prominence as a delivery system was receding. In the intervening years, the inadequacies of available sources such as attaché reporting, and the failure of new collection methods such as reconnaissance balloons, produced a particularly dark period of intelligence collection, which overlaps with the bomber's zenith as an intelligence target.

[29]Aid, 'National Security Agency', 37–38.
[30]Aldrich, *GCHQ*, 111.
[31]Aid, 'National Security Agency', 38.
[32]Dino A. Brugioni, *Eyeball to Eyeball: The Inside Story of the Cuban Missile Crisis* (London: Random House 1991), 65 & 71.
[33]Gregory Pedlow and Donald Welzenbach, *The Central Intelligence Agency and Overhead Reconnaissance* (Washington, DC: History Staff, Central Intelligence Agency 1992), 104.
[34]Ibid., 85.

Virtually all of the meagre information available was what David Kahn calls 'physical intelligence', which is 'drawn from things, not words'. This pertained mostly to Soviet capabilities, essentially the specifications and quantities of extant aircraft. Conspicuously absent was Kahn's second category, 'verbal intelligence', which 'deals with intentions'.[35] Comint and Humint, which are capable of extracting this sensitive information, did not perform as well as they could have done. This meant that future, strategic plans remained especially obscure and open to interpretation. Intelligence estimates were constrained by a paucity of information which extended beyond the horizon of the present.

Bomber intelligence estimates, 1946–1958

As early as 1945, Soviet planners recognised that the manned bomber showed the most immediate promise as a delivery platform for when the USSR eventually crossed the nuclear threshold.[36] In April 1946, the Long-Range Aviation (LRA) of the Armed forces of the USSR was formed, establishing the future home of the strategic bomber force, and enshrining the new, key role of strategic bombing in Soviet planning.[37] The news seeped through to the UK and the US with the assistance of Tokaev, who told his interrogators that the Soviets now viewed it as 'essential' to develop 'modern aircraft', which they would 'introduce into service as quickly as possible'.[38] With the UK and the US now aware of the USSR's new efforts, there were three key questions for bomber estimates to answer, regarding the date of entry into service, the operational capabilities, and the production quantities of these aircraft, which together constituted the overall bomber threat.

The first strategic bomber

During the war, the USSR had come into possession of three American B-29 Superfortress bombers which were forced to land in Soviet territory when they ran out of fuel. [39] Copies were made and the new bomber, dubbed the TU-4 'Bull' in NATO nomenclature, had its first test flight in July 1947.[40] The development of the Bull and its growing significance within wider Soviet strategy was soon understood by both the US and the UK.[41] Far more

[35]David Kahn, 'An Historical Theory of Intelligence', *Intelligence and National Security*, 16/3 (2001), 81–2.
[36]Stephen M. Meyer, 'The Soviet Theatre Nuclear Force Posture, Part II: Capabilities and Intentions', *The Adelphi Papers*, 24/133 (1983), 4.
[37]Kadyshev, 'Strategic Aviation', 352.
[38][Kew, United Kingdom, The National Archives] [Ministry of] DEFE[nce] 40/25 A.D.I. 304/48, ['U.S.S.R.: Notes on Aircraft Design and Production', September 1948].
[39]Otis Hays, *Home from Siberia: The Secret Odysseys of Interned American Airmen in World War II* (College Station: Texas A & M University Press 1990), 119, 131, 133.
[40]David Holloway, *Stalin and the Bomb: The Soviet Union and Atomic Energy 1939–1956* (London: Yale University Press 1994), 235 & 243.
[41][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 158/2 JIC(47)51(0)(Final), ['Progress of Soviet Aircraft Development', 29 Aug. 1947].

difficult a task lay in determining the security implications of this new aircraft. With the USSR's first test of an atomic explosion, the Bull emerged as the likely delivery vehicle. The American ONE started producing its formal National Intelligence Estimates (NIEs) in 1950, and judged that the USSR has 'the capability in aircraft and trained crews to enable it to attempt to deliver in the United Kingdom and North America the full stockpile of atomic bombs that are available'.[42] This was false, as the extensively-modified Bull that was capable of carrying a nuclear bomb would not enter service for another 4 years.[43] The British JIC judged the same year that while the 'TU 4 bomber has gone into quantity production … it is unlikely that the Long Range Force will be capable of effectively undertaking … atomic bomb attacks until 1955', in part because these aircraft would not be 'modified to carry atomic bombs' until then.[44]

The threat to the UK

The TU-16 'Badger' was the jet-powered bomber designed to replace the ageing Bull. It entered the SAF in early 1954, the same year that aeroplane-deliverable nuclear ordnance finally became available.[45] The Badger was consequently the first to pose a significant nuclear threat to the UK.[46] As early as 1950, the JIC had correctly anticipated that the 'medium bomber force' would have 'jet types' 4 years later.[47] This assessment maintained for the following years, despite the difficulty added to the task by the Badger's absence from any public appearance before it entered service.[48]

It should be noted that the British were not always more accurate on this matter, having significantly underestimated Badger production levels. In 1955, when the USSR had 300 aircraft,[49] the JIC assessed there to be half this number.[50] Conversely, the Americans were not always less accurate.

[42][http://primarysources.brillonline.com, 24 Apr. 2016] NIE-3, ['Soviet Capabilities and Intentions', 15 November 1950].
[43]Kadyshev, 'Strategic Aviation', 340–1.
[44][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 158/11 JIC(50)77(Revise), ['The Likelihood of War with the Soviet Union and the Date by which the Soviet Leaders Might be Prepared to Risk it'. 18 August 1950].
[45]Kadyshev, 'Strategic Aviation', 342 & 352.
[46][Kew, United Kingdom, The National Archives] [Ministry of] DEFE[nce papers] 32/4 COS 221/25/2/25, ['United States Strategic Policy', 25 February 1954].
[47][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 158/11 JIC(50)98(Final), ['Soviet Capabilities and Intentions 1951 and 1954 – Brief for Western European Regional Planning Group', 27 November 1950].
[48]Holloway, *Stalin and the Bomb*, 243.
[49]Robert P. Berman and John C. Baker, *Soviet Strategic Forces: Requirements and Responses* (Washington, DC: The Brookings Institution 1982), 136.
[50][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 158/19 JIC(55)3(Final), ['Soviet Bloc War Potential, 1955–1959', 24 March 1955].

They produced higher estimates of Badger numbers which, unusually, resulted in greater accuracy. In a 1955 NIE, the USSR was estimated to have 200,[51] which was less erroneous than the British figure. But while Badger numbers were a key component of the overall threat, their specifications and capabilities were also crucial. The aeroplane's purpose from its inception was to play a 'eurostrategic' role,[52] as their primary targets, NATO's nuclear forces, were mostly placed a medium distance from the USSR in Western Europe.[53] The British were better at recognising this, the JIC rightly concluding in 1956 that Badgers would constitute the 'main weight of a Soviet air attack against the United Kingdom'.[54]

American estimates, however, repeatedly envisioned scenarios in which Badgers would be used for an attack on the US, which as a theatre bomber was not the aircraft's purpose. A 1955 NIE estimated that on one-way missions, Badgers 'could reach as far as Detroit, St. Louis, and Oklahoma City'.[55] This was technically correct, as the Badger was capable of carrying a nuclear bomb of the 1951 design for 5760 km,[56] enough to reach most of the targets listed in this NIE. Suggesting that the Soviets would undertake such a costly plan was a very contentious proposition. The estimates that entertain this idea, however, provide no more analysis than the flat statement that they 'believe it almost certain that the USSR is psychologically capable of employing one-way missions'.[57] This one shaky contention underpins the Badger's alleged threat to the US. As detailed later, Soviet leaders were unwilling to even consider one-way missions.

American analysts favoured the information which fitted their expectations, leading to the conception of a Badger threat to the homeland which did not exist. Conversely, the British underestimated quantity, while accurately rating capability, which produced the opposite outcome. Their error was relatively insignificant, however, as the number of Badgers they anticipated was still much higher than the meagre '30–120 atomic bombs' that were believed to be required to 'cause the collapse of the United Kingdom',[58] against which the Air Defence Committee judged there 'no effective defence'.[59] For Britain and

[51][http://media.nara.gov, 24 Apr. 2016] NIE 11–7-55, ['Soviet Gross Capabilities for Attacks on the US and Key Overseas Installations and Forces through 1 Jul. 1958', 23 Jun. 1955].
[52]Kadyshev, 'Strategic Aviation', 342 & 370.
[53]Holloway, *Stalin and the Bomb*, 66–7.
[54][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 158/24 JIC(56)41(Final), [Likely Scale and Nature of Attack on the United Kingdom in Global War up to 1960', 10 May 1956].
[55]NIE 11–7-55.
[56]Holloway, *Stalin and the Bomb*, 243.
[57]NIE 11–7-55.
[58]Stephen Twigge & Len Scott, *Planning Armageddon: Britain, the United States and the Command of Western Nuclear Forces 1945–1964* (Amsterdam: Harwood Academic Publishers 2000), 23.
[59]John Baylis, *Ambiguity and Deterrence: British Nuclear Strategy 1945–1964* (Oxford: Clarendon Press 1995), 138.

the US, different assumptions played a significant role in interpreting the limited information on offer and produced these contrasting conclusions.

The threat to the US

With the longest range, heavy bombers offered the Soviets the greatest potential to strike the US. The first to become known to the West was the M-4 (later 3M) 'Bison', and the Americans expected its emergence sooner than the British. 'Part of the configuration' of this aircraft 'was observed at an experimental establishment in mid-1953 … by Allied intelligence', notes a 1954 US estimate, which goes on to expect that 'series production … will begin in 1956'.[60] The British also recorded this observation, but concluded that 'there is no evidence to indicate production of this type'.[61] At the 1954 May Day air show, a single Bison appeared. Both the CIA and USAF took this as further evidence for their estimate that it would enter series production in 1956.[62] It was not *until* this point that JIC came round to the idea that the Soviets had an 'intention of building a force of these aircraft', and they still preserved a little more optimism than the Americans, expecting another 2–3 years to pass before 'any significant force of these aircraft can be assembled'.[63] The parallel TU-95 'Bear' project suffered numerous setbacks, so it was not until the rehearsals for the 1955 May Day display that the Americans and British first encountered the aircraft.[64] This first sighting was enough for the Americans to decide that it was already in operation.[65] The JIC, meanwhile, waited another 2 years before correctly assessing that it 'has entered service'.[66]

Specifications and capabilities

Designed from the outset for intercontinental flight, the ranges of the Bear and Bison were critical. The Bison could manage only 9000 km, barely half of its target. It was put into production anyway while a solution was sought,[67] which arrived in 1956. The updated 3M Bison had a range of 11,800 km, which was an improvement, but still not a fully realised two-way strike

[60] SNIE 11–2-54.
[61] [Kew, United Kingdom, The National Archives] CAB[inet Office papers] 176/47 DSI/JTIC(53)32, ['Report on Russian Research and Development', February 1954].
[62] Freedman, *U.S. Intelligence*, 65; Prados, *Soviet Estimate*, 41.
[63] JIC(55)7(Final).
[64] [Kew, United Kingdom, The National Archives] CAB[inet Office papers] 158/19 JIC(55)8/18, 'Weekly Summary of Current Intelligence as at 28th April, 1955', 28 April 1955; Freedman, *U.S. Intelligence*, 66.
[65] NIE 11–7-55.
[66] [Kew, United Kingdom, The National Archives] CAB[inet Office papers] 158/28 JIC(57)39(Final), ['Likely Scale and Nature of Attack on the United Kingdom in the Early Stages of Global War up to 1961', 19 June 1957]; Zaloga, *Nuclear Sword*, 28.
[67] Holloway, *Stalin and the Bomb*, 245.

capability on the US.[68] Various workarounds were subsequently attempted, none of which were particularly successful.

Staging the bombers at the furthest fringes of Soviet territory would make the most economical use of their limited range. Experiments were made with operating from the USSR's Arctic regions,[69] but after technical setbacks the Soviets' final decision was to continue basing all their heavy bombers deep within the territory of the USSR.[70] But the Americans, having detected in 1956 improvement works on Soviet aviation facilities in the Arctic,[71] still felt it reasonable to base range calculations 'on the assumption that these bombers would be launched from Soviet bases closest to North America … [those] in the Central Arctic'.[72] The JIC, meanwhile, rightly noted as late as 1957 that 'Arctic bases' had not yet been sufficiently 'developed' to make possible 'effective two-way operations covering all targets in North America'.[73]

Mid-air refuelling was another method through which Bisons could potentially reach the US and return again. This system was deployed, boosting the bomber's range to 15,000 km, a figure just below the original target.[74] But this was not until 1958, when the 3M version came into operational units,[75] and was from then on restricted by the very limited numbers of tanker aircraft available, which were never higher than 25.[76] American estimates of the mid to late 1950s still continued to believe that 'during the next few years [the USSR] will achieve a substantial inflight refuelling capability'.[77] The JIC maintained into 1957 that this was unlikely because 'there is still no evidence of an operational capability for aerial refuelling'.[78]

The 12,000-km range of the Bear was better than the Bison, but this was still less than desired. It also flew more slowly, increasing its vulnerability to air defences.[79] Arctic basing was trialled but, as with the Bison, this also failed because of technical problems,[80] and inflight refuelling was developed but this was not deployed until 1961.[81] From the outset in 1955, the

[68]Kadyshev, 'Strategic Aviation', 377.
[69]Zaloga, *Nuclear Sword*, 30.
[70]Kadyshev, 'Strategic Aviation', 342.
[71][http://gateway.proquest.com, 24 Apr. 2016] CIA, Project S-47: ['Extent of Military Construction at Soviet Arctic Airfields', 17 February 1956].
[72][http://gateway.proquest.com, 24 Apr. 2016] Director of Central Intelligence, 'Communist Bloc Air Capabilities through mid-1959'. [Presentation to the Symington Committee, 17 April 1956].
[73][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 158/27 JIC(57)4(Final), ['Soviet Strategy in the Event of Global War up to the End of 1961', 1 January 1957].
[74]Zaloga, *Nuclear Sword*, 26.
[75]Kadyshev, 'Strategic Aviation', 376–7.
[76]Zaloga, *Nuclear Sword*, 24.
[77][www.foia.cia.gov, 24 Apr. 2016] NIE 11–4–56, ['Soviet Capabilities and Probable Courses of Action through 1961', 2 August 1956].
[78]JIC(57)39(Final).
[79]Kadyshev, 'Strategic Aviation', 381.
[80]Zaloga, *Nuclear Sword*, 28.
[81]Kadyshev, 'Strategic Aviation', 383.

Americans nevertheless began to repeatedly to envisage scenarios for 'maximum scale attack' in which the Bear would be refuelled in-flight, carry out one-way missions, and be based in the Arctic from 1958 onward.[82] The British, meanwhile, rated its specifications 'inadequate to meet the likely standards of North American air defence'.[83]

Production numbers

The 'bomber gap' delusion which took hold in America was fundamentally a matter of how many Bisons and Bears the Soviets were forecast to produce. The US estimates expected that by the end of the 1950s, a 'gap' would emerge between the number of Soviet and American heavy bombers, because the Soviets were assessed to be producing them faster than the Americans were B-52s. If this had occurred, the Soviets would have had an expanding strategic advantage, and the US and its allies would face a growing vulnerability to nuclear attack, so the argument went.[84]

When the Bison made its first public appearance in the spring of 1954, British and American assessments were comparable.[85] The turning point came the following year. At the preparations for the 1 May air show in 1955, the British Air Attaché reported seeing ten Bisons at 'the final rehearsal on 28th April'.[86] The Americans, however, claimed to have seen 'as many as 13'.[87] Only ten had been built by this point,[88] so the Americans were clearly wrong. The discrepancy is explained by the US misidentification of other aircraft flying in the parade. There were an additional '[t]hree of the new four-turbo propeller aircraft', most likely designed for 'maritime reconnaissance', which were 'of a size similar to the Type 37 [Bison]', according to British observers.[89] Visibility was very bad, as the rehearsals that year took place in 'extremely poor weather conditions',[90] suggesting that the

[82]NIE 11–7-55.
[83][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 158/27 JIC(57)7(Final), ['The Soviet Strategic Air Plan in the Early Stages of a Global War 1957–1961', 28 February 1957].
[84]Prados, *Soviet Estimate*, 42–43.
[85][http://research.archives.gov, 24 Apr. 2016] SNIE 11–7-54, ['Soviet Gross Capabilities for Attacks on the US and Key Overseas Installations through 1 July 1957', 17 August. 1954]; [Kew, United Kingdom, The National Archives] CAB[inet Office papers] 158/17 JIC(54)3(Final), ['Soviet and Satellite War Potential, 1954–1958', 15 February 1954].
[86][Kew, United Kingdom, The National Archives] AIR [Ministry papers] 8/2460 D.D.I.3/TS.44/Air, ['May Day Fly Past – Moscow', Loose Minute, 29 April 1955].
[87]NIE 11–7-55.
[88]Kadyshev, 'Strategic Aviation', 375.
[89][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 158/19 JIC(55)8/19, ['Weekly Summary of Current Intelligence as at 5th May 1955', 5 April 1955].
[90][Kew, United Kingdom, The National Archives] CAB[inet Office papers 158/19 JIC(55)8/17, ['Weekly Summary of Current Intelligence as at 21st April, 1955', 21 April 1955'].

Americans mistook these three reconnaissance aeroplanes for the Bisons they resembled.

The actual May Day parade was cancelled, so assessments were made from what was seen at the rehearsals. The number of Bisons observed by the Americans was only a little higher than the British, but this discrepancy fed into the broader dynamics which were already producing divergent estimates. The JIC were 'now prepared further to raise [their] own national estimate', but there was no 'immediate urgency' for this to take place.[91] The Americans, meanwhile, took what they had seen to indicate 'a significant increase in Soviet heavy bomber production over that previously estimated'.[92] This led the US to the conclusion, as Prados shows, that 'by mid-1959 the Long-Range Air Force would be more powerful than the Strategic Air Command'.[93] The 'bomber gap' had emerged.

The next parade of 1955, which took place on the USSR's Aviation Day, features prominently in academic studies of the bomber gap. Prados claims that what was allegedly seen on this occasion 'encourage[d] U.S. intelligence to revise its projections … upwards yet again',[94] Kaplan believes that at this point 'the real intelligence scare' began,[95] and Freedman alleges that it provided 'a further boost to US alarms'.[96] But examination of the sources relied upon by these scholarly accounts, held alongside the primary source material, shows that this orthodox understanding is inaccurate.

According to Kaplan, 'American attachés reported seeing … twenty-eight [Bisons] in all', on 'July 13, 1955, the U.S.S.R.'s Aviation Day'. Kaplan's only source for this is Freedman,[97] whose account is the same with the additional explanation that 'the Russians had created an illusion of greater strength by flying the same planes around the reviewing stand at regular intervals'.[98] Freedman cites only one source for his whole account, the memoir of Allen Dulles, in which the former Director of Central Intelligence (DCI) claims that 'the same squadron had been flying around in circles'.[99] Prados agrees, writing that it 'appears that the Soviets … executed a deceptive flyover'.[100] He gives only one piece of evidence, that of 'the U.S. air attaché to the Soviet Union'. Apparently this was Colonel Charles E. Taylor, who reportedly saw 28 as well, in the form

[91][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 159/19 JIC(55)41st Meeting, [25 May 1955].
[92]NIE 11–7-55.
[93]Prados, *Soviet Estimate*, 42.
[94]Ibid.,43.
[95]Kaplan, *Wizards of Armageddon*, 156.
[96]Freedman, *U.S. Intelligence*, 66.
[97]Kaplan, *Wizards of Armageddon*, 156 & 406.
[98]Freedman, *U.S. Intelligence*, 66.
[99]Allen Dulles, *The Craft of Intelligence* (New York: The New American Library 1965), 139.
[100]Prados, *Soviet Estimate*, 43.

of 'first ten and then eighteen Bison jet bombers'.[101] Prados provides no source, so this cannot be verified. This means that the three classic studies of the bomber gap and the supposed Aviation Day deception are drawn entirely from the retrospective accounts of just one or two US participants.

Documentary sources reveal that something very different took place. Firstly, the date is wrong. The CIA recalls the 'Aviation Day Airshow of 3 July 1955' in a memorandum from October of that year.[102] The British Air Ministry agrees that it 'took place on 3rd July'.[103] This is independently verified by aeronautical publication *Flight*, which ran a piece on 'Aviation Day, celebrated throughout the Soviet Union last Sunday, July 3rd' the week after the event.[104] Proceedings at this display were far less remarkable than Freedman, Kaplan, and Prados present them to have been. The British as well as *Flight* reported seeing just 12 Bisons,[105] and crucially so too did the Americans. The CIA recorded that the 'Aviation Day Air Show of 3 July 1955 included 12 Bison aircraft'.[106] Note that it was common practice for striking air parade observations to be remarked upon in subsequent US estimates. NIE 11-10-55, released in August, contains no mention of Aviation Day, nor do the bomber estimates of the following year, NIE 11-56 and NIE 11-4-56. If 28 Bisons had been seen, it is highly unlikely that reference would not have been made to this momentous event in one of these documents.

Freedman does rightly observe that before the supposed Aviation Day deception, a 'trend in US estimates had already started to emerge'.[107] NIE 11-56 subsequently incorporated the newly-discovered Bear as well as the Bison, expecting 300 of the former and 400 of the latter by 1959.[108] British projections remained lower and more accurate. The JIC read NIE 11-56, and judged that in the 'various sections on Soviet aviation … the Russian capability was overstated'. This 'was a difference which had persisted for some time and had been the subject of frequent discussions with the Americans'.[109] A British estimate finished in the same month as NIE 11-56

[101]Ibid.
[102][www.foia.cia.gov, 24 Apr. 2016] CIA/RR IM-414, ['Quarterly Estimate of the Production of Aircraft in the Sino-Soviet Bloc April-June 1955'. 3 October 1955].
[103][Kew, United Kingdom, The National Archives] AIR [Ministry papers] 40/2769 Air Ministry, ['Secret Intelligence Summary' September 1955, vol. 10, no. 9].
[104][www.flightglobal.com/archive, 24 April 2016] 'Soviet Aviation Day', Flight and Aircraft Engineer, vol. 68, no. 2424. 8 July 1955.
[105][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 158/19 JIC(55)8/28, 'Weekly Summary of Current Intelligence as at 30th June 1955', 6 July 1955'.
[106]CIA/RR IM-414.
[107]Freedman, *U.S. Intelligence*, 66.
[108][www.foia.cia.gov, 24 April 2016] NIE 11–56, ['Soviet Gross Capabilities for Attack on the US and Key Overseas Installations and Forces through mid-1959', 6 March 1956].
[109][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 159/23 JIC(56)41st Meeting, 2 May 1956.

credits the Russians with a total of 600 Bears and Bisons by 1959.[110] While the British were more accurate than the US in a relative sense, they were still way over the mark. By 1960 a total of just 116 Bisons and 85 Bears had been produced.[111]

British estimates reached their upper limit here,[112] but the US continued to rise. The August 1956 estimate set the high-water mark, expecting 500 Bisons and 300 Bears by 1960.[113] It was not until June 1958 that the Americans admitted that Bison and Bear 'production and introduction has been at very low and uneven rates', discovering that 'between 100 and 125' was the genuine number in operation.[114] By the end of the 1950s, the bomber's primacy had slipped. The ballistic missile had become the dominant Soviet delivery vehicle, when the first successful test on 21 August 1957 demonstrated its impending rise to primacy.[115] Then-leader Nikita Khrushchev explains that the Soviets realised they 'needed to have some means more reliable than bombers of delivering bombs to their targets'.[116]

The bomber gap closes

The poor quality of intelligence available during the 'bomber gap' period made it possible for such profound differences between British and American estimates to emerge. This mechanism worked in reverse to help end the bomber gap myth, as the new availability of more conclusive intelligence reduced the extent to which interpretation and inference was necessary. The U-2 spyplane was instrumental in this process. Its first flight over the Soviet Union took place on 4 July 1956, producing images which impressed their viewers with their level of detail.[117] Missions continued through into 1957, and as the Soviets did not employ camouflage and concealment techniques,[118] analysts could count the bombers on the ground, slowly discovering the actual number in force. Its influence should not be overstated, as the CIA which ran the U-2 programme still conceded that 'there are significant gaps' in their present 'photographic coverage' as late as August 1957.[119] Matthew Aid claims

[110][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 158/23 JIC(56)3(Final), ['Sino-Soviet Bloc War Potential, 1956–60', 14 March 1956].
[111]Zaloga, *Nuclear Sword*, 26 & 247.
[112]JIC(57)39(Final).
[113]NIE 11–4-56.
[114][www.foia.cia.gov, 24 Apr. 2016] SNIE 11–7–58, ['Strength and Composition of the Soviet Long Range Bomber Force', 5 June 1958].
[115]Zaloga, *Nuclear Sword*, 54–59.
[116]Nikita Khrushchev, *Khrushchev Remembers, Volume Two: The Last Testament* (London: Little, Brown and Company 1974), 43.
[117]Andrew, *President's Eyes*, 223.
[118]Brugioni, *Eyeball to Eyeball*, 31.
[119][http://primarysources.brillonline.com, 24 Apr. 2016] CIA, 'Aquatone Briefing [Paper for the Joint Chiefs of Staff RE: Guided Missiles, Atomic Energy, and Long Range Missiles', 28 August 1957].

that 'Sigint helped debunk the myth', but the earliest US estimate that he cites to demonstrate that Sigint altered estimates is SNIE 11-7-58, which was circulated almost a year after the first reductions to estimated bomber strength appeared. Although Sigint might therefore have contributed to the decline of the 'bomber gap', its impact was felt too late for it to have been more than a contributory factor. The missing explanatory factor is inextricably tied to the explanation for differences between British and American estimates.

Bomber intelligence analysis

When assessing each new Soviet bomber, the British were almost always more accurate than the Americans about the date it would enter service, the capabilities it would have, and the quantity which would be built. Why was this?

The orthodox interpretation's level of emphasis on Soviet trickery is excessive, given the primary source evidence which contradicts accounts of deceptive flyovers. Nor were statements from the Soviet leadership over this period supportive of the idea that they were pursuing a large bomber force. Horelick and Rush list the Soviets' main strategic announcements during the mid-1950s, and not one of them contains any explicit mention of bomber aircraft.[120] Excessive overemphasis of their bomber strength would have run counter to Soviet interests and security in several important ways. Khrushchev recalls the pervasive fear in the Kremlin that 'America had a powerful air force and, most important, America had atomic bombs, while we had only just developed the mechanism and had a negligible number of finished bombs'.[121] It is true that the Soviets sought, through air shows and suchlike, to demonstrate that the USSR was augmenting its strategic bomber force, showing the West that a growing ability to retaliate was making the prospect of attacking the USSR an increasingly costly enterprise. But for the Soviets to execute a ploy to suggest that bomber progress had been far more rapid than previously anticipated would have risked provoking the US into increasing its degree of superiority further still. The Soviets generally boasted about the delivery system in which they were leading, ballistic missiles, hence Khrushchev's graphic claim that the USSR was turning them out 'like sausages'.[122] Explanations for estimate outcomes must therefore be sought in the US and the UK, rather than from Russia.

[120]Arnold L. Horelick and Myron Rush, *Strategic Power and Soviet Foreign Policy* (Chicago: The University of Chicago Press 1966), 28–9.
[121]Khrushchev, Nikita. *Khrushchev Remembers, Volume Three: The glasnost Tapes* (Boston: Little, Brown and Company 1990), 100–1.
[122]Prados, *Soviet Estimate*, 77.

Contrasting worldviews

The starting point of the estimative process is the analysts' worldview, as this forms the lens through which the information they encounter is scrutinised. There was a contrast between perspectives in Britain and America, especially concerning the magnitude and nature of the Soviet threat. With Britain having a historical familiarity with the prospect of strategic defeat and an acute geographical vulnerability to nuclear attack, its defence planners considered this subject in depth from the outset of the Cold War. They recognised in 1947 that 'Russia' posed the 'most likely and formidable threat to our interests', but the level of threat was tempered by the judgement that it would not be until 1957 that the USSR would 'probably be in a position to use some atomic bombs'.[123] Sharing this outlook, the JIC assumed that as the USSR would remain in a position of nuclear inferiority for the coming decade,[124] its policy for the time being 'directed primarily towards achieving the greatest possible measure of security'.[125] Viewing the USSR's situation as inferior and its policy as defensive meant that the JIC came to expect the UK to be the Soviets' primary target in nuclear war, as much of NATO's superior nuclear forces were increasingly being based in the British Isles. In the event of war these would pose the gravest threat to the USSR, so the JIC considered that the Soviets would seek to snub a Western nuclear strike by eliminating the UK as quickly and decisively as possible.[126]

America, having enjoyed decade upon decade of 'free security' by virtue of its vast terrain coupled with its Atlantic and Pacific vallations, did not definitively examine these questions until some years later. When this occurred, the US's newfound vulnerability elicited a far more visceral response. American planners concluded in 1950 that the Soviets primarily sought the 'extension of their authority and the ultimate elimination of any effective opposition to their authority', and that the US was seen as 'the principal enemy' to the realisation of this enterprise. Development of Soviet 'military capacity' was thus not so much for its defence, but 'to support its design for world domination'. It was consequently expected that from as early as 1954 the Soviets would have sufficient nuclear capability to 'seriously damage' the US.[127] The US intelligence assumed that in the event of general war, 'major Soviet objectives' would firstly be

[123]DO(47)44 'The Overall Strategic Plan', May 1947, quoted in Julian Lewis, *Changing Direction: British Military Planning for the Post-war Strategic Defence, 1942 – 1947* (London: Frank Cass 2005), 377.
[124]JIC(57)39(Final).
[125][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 81/132 JIC(46)1(0) Final(Revise), ['Russia's Strategic Interests and Intentions', 1 March 1946].
[126][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 158/15 JIC(53)36(Final) (Revise), ['Probable Soviet Strategy in the Event of General War 1953–1956', 24 June 1953'].
[127][http://legacy.wilsoncenter.org, 24 April 2016] NSC-68, ['United States Objectives and Programs for National Security', April 14 1950].

to destroy the 'capabilities for nuclear retaliation' located in the *continental* US, and secondly to attack American 'urban, industrial, and psychological targets'.[128] 'United States opinion [was] very sensitive to the Soviet threat to the North American continent', observed British personnel.[129]

Opposing assumptions

These contrasting worldviews gave birth to the opposing assumptions which guided the bomber estimation process. 'Reliable intelligence on the enemy's long-range plans and intentions', remarked the CIA in 1953, 'is practically non-existent'.[130] Consequently, the process by which analysts anticipated bombers' entry into service often had to begin with the Soviets' anticipated goal, and work backwards. Envisaging an opponent bent on imminently achieving the capability to destroy the US, American analysts expected the USSR to be bringing heavy bombers into service as quickly as possible. For instance, the CIA noted that as of 'January 1954, no … heavy jet bomber was known to be in series production', but the 'existence of a program to develop' them 'was strongly indicated' by what they saw as the 'logic of such a requirement', given their view of Soviet aims.[131] The British were, of course, constrained by the same paucities of information, but were less prone to take glimpses of a new bomber as a sign of impending acceptance into service, a tendency which was grounded in their alternative worldview. For example, the Air Ministry considered that the Soviets 'would not be able to put sufficient effort into the creation of an air fleet' for use 'against the United States', because their bomber development efforts were being directed elsewhere.[132]

Similarly, scarcity of intelligence made bombers' technical and operational capabilities difficult to determine. As a substitute, American analysts used the operations of the US aerospace manufacturers as a template with which to fit together fragments of information on Soviet practices.[133] This led to overly generous conclusions because Soviet bombers missed their target specifications and were built with relative crudeness, failing to rival their Western counterparts. But this method would have seemed reasonable to American

[128]SNIE 11–7-54.
[129][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 158/14 JIC(52)68(Final), ['Soviet Bloc Strengths and Capabilities – Comments on SG 161/3 and SG 161/4', 31 October 1952].
[130][http://primarysources.brillonline.com, 24 Apr. 2016] CIA, 'Intelligence on the Soviet Bloc', [Intelligence Report, 31 March 1953].
[131][http://primarysources.brillonline.com, 24 Apr. 2016] CIA, 'Soviet Jet Bombers', [Draft NSC Briefing, 27 April 1954].
[132][Kew, United Kingdom, The National Archives] AIR [Ministry papers] 8/1934, P.S. to C.A.S., to A.C.A.S., ['Soviet and Satellite War Potential 1954 – 1958 J.I.C.(54)3', 1 March 1954].
[133]Alfred Goldberg, 'The Military Origins of the British Nuclear Deterrent', *International Affairs*, 40/4 (1964), 183.

analysts at the time, who assumed that 'Soviet scientific and technical capabilities continue to expand rapidly', being able to 'achieve near parity with the US in areas of critical military … significance'.[134] Conversely, the British were more inclined to view Soviet technical capabilities as 'limited', because of the influence of 'cultural, even racial, stereotypes', according to Aldrich.[135] This is consistent with the JIC's long-held opinion of the LRA, that by 'Western standards its efficiency is low and it lacks the technical and operational ability to mount an effective attack against the United States'.[136]

This process skewed American quantity projections too. Assuming the Soviets' primary goal was to destroy a large number of targets in the US, targeting studies calculated that a force of at least 500 intercontinental bombers would be required. American analysts selected from the available evidence to construct models of how the Soviets would reach this goal.[137] The USAF was the strongest proponent of elevated production estimates, a position that was rooted very much in its own experience. Edward Kaplan explains how the 'air atomic' idea, which placed 'emphasis on launching a decisive force at the outbreak of war', gained a status of such primacy for the USAF that its staff were 'convinced that there was one best way to apply airpower', and that this 'meant a tendency to mirror-image their own capabilities and objectives' onto the USSR.[138] Inflated expectations of Soviet production were the result. Records of the British manner of calculation are rare, but what little there is suggests that a comparable method was employed. For instance, the JIC criticised a NATO estimate because it credited the Soviets with 'more medium jet bombers than we consider necessary to meet Soviet requirements for medium range targets'.[139] This explains the British tendency to project lower production quantities, even when this led to excessively low conclusions about medium bombers. Badger projections were based on what the British thought the 'Soviet Command' would consider an 'adequate force for the purpose of attacking medium range targets', which in retrospect was an overly optimistic assumption.[140] A more limited British conception of Soviet goals therefore drew their quantity estimates downwards, while the same dynamic buoyed the Americans' upwards.

[134]NIE 11–4-56.
[135]Richard J. Aldrich, 'British Intelligence and the Anglo-American "Special Relationship" during the Cold War', *Review of International Studies*, 24/3 (1998), 332.
[136][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 158/21 JIC(55)58(Final) (Revise), ['Likely Soviet Courses of Action up to 1st January, 1957', 30 September 1955].
[137]Kaplan, *Wizards of Armageddon*, 157.
[138]Kaplan, Edward. *To Kill Nations: American Strategy in the Air-Atomic Age and the Rise of Mutually Assured Destruction*. (New York: Cornell University Press 2015), 56 & 79.
[139][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 158/20 JIC(55)30(Final), ['Soviet Bloc Strength and Capabilities 1955–1959 Comments on Standing Group Estimate SG 161/8', 6 April 1955].
[140]JIC(55)3(Final).

Institutional procedures

Estimative practices were not uniform within each national intelligence community, and these differences left a deep mark on the finished reports they produced. Alternative interpretations emerged in both the UK and the US, but met different fates within contrasting organisational processes. The USAF's efforts to raise estimates were challenged by factions such as the CIA's economic division, which built the case that the Soviets did not have the industrial capacity for a bomber programme of the scale envisaged.[141] The USAF, however, had the specific mandate for these estimates, meaning that they consistently had the last word on the matter.[142] Rather than resolving competing arguments, it was standard practice in the US for alternative interpretations to be included as footnotes in the finished document. This allowed a spiral of contention to develop, as throughout the mid-1950s the estimates' janusian arguments grew increasingly vociferous in their opposition to one another. An August 1956 example is typical, in which fully half of the text on bomber strength is footnoted. Salvos of starkly opposing points are fired across the pages' central dividing line, the main text insisting on the veracity of its judgement as to what Soviet planners 'estimate their requirements to be', the notes beneath retorting that 'there is no evidence that Soviet leaders have established a requirement on this order as a goal'.[143]

Competing interpretations were handled very differently by the JIC, which often fulfilled its stated aim of being the 'anvil of discussion'.[144] This is illustrated by the following episode: in 1954 Air Vice Marshal Fressanges made the bold argument that 'the Soviet Union were capable of making an effective strike on North America … using Type-39 [Badger] aircraft'. Patrick Dean, the Chairman, tactfully reminded him that if the Committee agreed with him, this 'would represent a volte face … which would affect all their thinking on war'.[145] The subsequent estimate of the Soviet strategic air plan was a deft compromise, allowing the possibility of what Fressanges envisaged, without necessarily agreeing that this endeavour would be at all effective for the Soviets. The JIC assessed that 'should war occur in the early part of the period under review … jet medium bombers' might be used 'to deliver strikes' on 'North American targets', but this point was heavily caveated with emphasis that these would not be 'large-scale operations' and that they would be 'unable to cover the

[141]Prados, *Soviet Estimate*, 46.
[142][http://gateway.proquest.com, 24 Apr. 2016] Alfred Goldberg (ed.) *History of the Strategic Arms Competition 1945 – 1972, Part I* (Washington, D.C.: Historical Office, Office of the Secretary of Defense 1981), 183.
[143]NIE 11–4-56.
[144][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 163/6 JIC, 'The Intelligence Machine: [Report to the Joint Intelligence Sub-Committee', 10 January 1945].
[145][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 159/16 JIC(54)76th Meeting, 26 August 1954.

whole of the continent'.[146] In Britain, dispute was generally handled through discussion leading to resolution, which allowed alternative interpretations based on different assumptions to be heard out with the possibility of their influencing the final conclusion. The American process, however, gave primacy to an interpretation based on one set of assumptions while denying any others. This stoked the fires of disagreement, producing fierce heat but dim light as proponents intensified their commitment to their respective arguments.

Special relationship flux

The character of the Anglo-American intelligence alliance also had an influence. At the outset of Cold War, the British clung onto some seniority, but this was ebbing fast. Bomber estimates suggest that even at this early stage Britain had begun to slip. The JIC agreed to 're-write and modify' a report to be shared with the Americans because the JIC's conviction that 'the Russians could not aspire to knock out the United States' was worded in a way that 'might be unnecessarily provocative to the Americans'.[147] It was also common for the JIC to welcome American personnel to attend meetings, including the Directors of both USAF intelligence and the ONE.[148] The Americans were less hospitable, placing 'restrictions … on the participation' by the UK representative to the CIA 'in the drafting stages' of NIEs.[149]

As the bomber gap approached, the special relationship changed through some mixture of American obstinacy and British supination. As a consequence, the US increasingly isolated itself from what placative influence the UK might have offered. Simultaneously, the British found themselves increasingly susceptible to American influence, having decided that it was 'legitimate to amend [their] estimates … as a result of international discussions'.[150] This helps to explain why projected heavy bomber quantities, *the* indisputable issue for the Americans, came to be somewhat inflated for the British too. As Goodman argues, because of the UK's inferior nuclear capability and acute strategic vulnerability, a 'critical British objective … was to ensure American support'.[151] The British Government made this known to the JIC. In the peak year of 1956, Committee Chairman Patrick Dean told his colleagues that because of the disarmament talks that year, the Foreign Office was 'anxious to reach agreement with the Americans on the present

[146]JIC(55)7(Final).
[147][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 159/13 JIC(53)47th Meeting, 7 May 1953.
[148][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 159/15 JIC(54)48th Meeting, 27 May 1954.
[149][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 159/12 JIC(52)96th Meeting, 4 September 1952.
[150][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 159/19 JIC(55)35th Meeting, 4 May 1955.
[151]Goodman, *Nuclear Bear*, 215.

strength of Soviet Bloc forces', because negotiations were 'very difficult if we and the U.S. were divided on our facts'.[152] While these disarmament talks were taking place, the JIC altered its view of Soviet intentions to be more in line with those of the US, coming to the opinion that attacks on the 'war potential of North America' would be a higher Soviet priority than those on 'the United Kingdom base'.[153] Excessive projections of heavy bomber construction were the result. This process was not necessarily conscious, but American influence explains why British estimates of this kind were only *relatively* more accurate.

Parochial competition

The preceding factors were catalysed by parochial competition, expanding a disagreement among the intelligence community into a national debate in the US, while obviating this prospect in the UK. Steeped in the 'air atomic' concept which demanded a superior bomber force, USAF leaders 'became convinced that they must make national leaders share their conviction', Kaplan observes.[154] In alignment with this goal, methodologies which amplified the USSR's strength were employed by USAF intelligence officers. For instance, photographs taken of Soviet bombers at air shows revealed that their tail markings always ended with a number between zero and four, but never between five and nine.[155] American analysts were divided over their meaning, but USAF officers pushed their interpretation that aeroplanes were being numbered consecutively, which would have meant that twice as many bombers existed than had been observed.[156] They were wrong.[157] The CIA challenged the USAF, but this interpretation prevailed because the USAF had primary responsibility and, despite his doubts, DCI Allen Dulles was unwilling to step in to the fray.[158] Those who challenged the USAF interpretation, even their own personnel, suffered adverse consequences. Former CIA officer Scott Breckinridge recalls that a 'USAF major on detail with the CIA' developed competing methodologies which produced 'a much lower estimate of Soviet bomber strengths and capabilities'. Upon his return, 'the officer in question had become persona non grata in the air force'.[159] Contrastingly, 'officers who believed in air-atomic ideas were locked into

[152][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 159/24 JIC(56)76th Meeting, 23 August 1956.
[153]JIC(57)39(Final).
[154]Kaplan, *To Kill Nations*, 84.
[155]Another reason why circling of the airfield at the 1955 Aviation Day could not have taken place, because tail numbers would permit identification of individual aircraft, revealing the deception.
[156]Kaplan, *Wizards of Armageddon*, 158.
[157]This is why in May 1955 UK estimates of current Bison strength were exactly half that produced in the US, because they had evidently interpreted the numbering correctly.
[158]Kaplan, *Wizards of Armageddon*, 159.
[159]Scott D. Breckinridge, *CIA and the Cold War: A Memoir* (Westport: Praeger 1993) Ch. 12.

them, given the organizational success, measured in budget and influence, that the ideas brought', according to Kaplan.[160]

The bold course which was being charted by the USAF inevitably brought it into conflict with other national security stakeholders. It faced strong opposition from figures including Defense Secretary Wilson and President Eisenhower, as well as rival services, primarily the Navy. The admirals were not without cause to regard the ascendant young service, which had only been granted its full independence in 1947, as a challenger. The matter came to a head at hearings on air power hosted by the Senate Armed Services Commission in 1956. Critics such as Aldrich have raised objections to the propriety of the manner in which the USAF made its case.[161] LeMay, for instance, claimed that the CIA agreed with his numbers.[162] The USAF nonetheless prevailed, and Kaplan notes how at this point it had 'displaced the Navy from the leading edge' of the 'national security hierarchy', which in turn reinforced the ideas that had propelled it to this new peak.[163]

The parochial incentives of British estimators were very different. The Royal Air Force (RAF) is the oldest service of its kind, and the vast bombing experience it had accrued by the 1950s meant that it did not face the same urgency to carve out its role in the nuclear era as the USAF did. This contributed to a situation where, as Alfred Goldberg shows, 'circumstances combined to make the R.A.F. [sic] the logical nuclear instrument of the British defence establishment', and it consequently 'enjoyed production priority among the military services'.[164] Even if this were not the case, Britain was several paces behind the superpowers in terms of nuclear weapons development during the 'bomber gap' era, not having conducted an atomic test until 1952, and taking another 6 years to cross the thermonuclear threshold. Britain's delivery capability was therefore similarly lagging. By 1955, the Valiant was the only bomber to have entered service, the Vulcan and Victor not being ready for operation until 1957 and 1958, respectively.[165] What little independent nuclear capability there was, did not bear the weight of Western deterrence, as the American force did. Indeed, the JIC was of the view that if the Soviets launched a nuclear strike on Britain, 'such an attack would probably lead to an early American retaliation on the Soviet Union',[166] reflecting a core calculation of British planners. Even if a case was made for a higher bomber force, there was no hope of it finding traction due to the UK's

[160]Kaplan, *To Kill Nations*, 107.
[161]Aldrich, *Hidden Hand*, 560.
[162]Prados, *Soviet Estimate*, 44.
[163]Kaplan, *To Kill Nations*, 68.
[164]Goldberg, 'Nuclear Deterrent', 602 & 608.
[165]Goldberg, 'Nuclear Deterrent', 612.
[166][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 158/10 JIC(50)31(Final), ['Basic Intelligence Brief for U.K. Delegation to the Brussels Treaty Committee and the Western European, Northern European, and Southern European Regional Planning Groups', 10 May 1950].

crippled finances. As Chief of Naval Staff Sir Rhoderick McGrigor mused on Britain's strategic future in 1953, the 'real underlying difficulty, of course, is shortage of money. The Chancellor, as ever, cannot provide what each of the services considers is necessary'.[167] Consequently, British nuclear bomber development was already at maximum effort, constrained by the very limited resources available. This is why in 1955 planned British bomber stocks were revised down from 240 to 200, economic circumstance dictating policy.[168]

Finally, the British were sharply perceptive of the political interests inflating bomber estimates in the US. As early as 1952, the JIC noticed that for 'some years the United States Air Force have been keenly concerned with obtaining the funds and authority to expand', noting that one of their staff who had visited the US 'recollects numerous occasions on which the U.S.A.F. were at pains to establish the existence of the air threat to justify this expansion in the face of opposition', concluding that the USAF 'have worked hard on this, and the idea of this threat has gained wide acceptance'.[169] Being aware of what was really taking place in the US, the British were much better disposed to avoid mirroring it.

In the US, meanwhile, the previously-examined downward revision of bomber quantities that emerged in its estimates from November 1957, coincided with the ascendancy of the ballistic missile as the new existential threat. The USSR conducted a series of long range missile tests that summer, followed by the spectacular demonstration of Sputnik a month before the first revised estimate was published,[170] catching the US by surprise.[171] Although improved intelligence had helped dispel the 'bomber gap' myth, similar inadequacies still plagued British and American intelligence on Soviet missiles,[172] so the dynamics behind the first episode simply carried over into the second. As Freedman observes, 'the "bomber gap" begat the "missile gap"'.[173]

Conclusion

British and American bomber estimates were based on virtually the same intelligence. It was inconclusive, so estimators in the UK and the US had to rely on their assumptions in order to understand it. The difference between these assumptions set the British and Americans off in divergent directions.

[167]Baylis, *Ambiguity and Deterrence*, 152.
[168]Martin Navias, 'Strengthening the Deterrent? The British Medium Bomber Force Debate, 1955–56', *Journal of Strategic Studies*, 11/2 (1988), 208–10.
[169][Kew, United Kingdom, The National Archives] CAB[inet Office papers] 176/38 JIC/2137/52, 'Russian Capability of Achieving an "Aerial Pearl Harbour" in 1954', Note by Air Ministry Representative, 19 September 1952.
[170]Freedman, *U.S. Intelligence*, 71.
[171]Prados, *Soviet Estimate*, 63–4.
[172]Dylan, 'Britain and the Missile Gap', 782.
[173]Freedman, *U.S. Intelligence*, 67.

Contrasting scopes for parochial capitalisation drew their conclusions even further apart, which led the Americans to produce less accurate estimates than the British. This trend is apparent from the emergence of the Soviet strategic bomber in 1946, through to its eclipse by the missile by 1958. The UK estimates were far from perfect, but even so they were generally more accurate than the Americans about the key questions of entry into service, production quantities, and operational capabilities; retaining enough independence of judgement to evade the 'bomber gap' fiction.

Contrary to orthodox accounts, Soviet deception was not a central cause of bomber overestimation. This means that the evidence on which excessive US estimates were based was even thinner than previously acknowledged, revealing that advocates of raised estimates must have pushed even harder for their conclusions to be accepted than previously thought. Thus despite the 'bomber gap' already being a classic example of political incentives distorting intelligence, the phenomenon's role was even larger than commonly appreciated. Many in Britain and the US were aware of why the bomber gap delusion had really emerged, yet were unwilling or unable to prevent its repeat. Andrew's rather pessimistic observation that just because a lesson is identified, does not mean that it is learned,[174] rings true.

The centrality of assumptions in this episode puts extra weight behind arguments about intelligence performance which emphasise factors such as psychology and politics,[175] but this does not mean that tangible organisational structures did not play an important role. The British process resolved competing arguments into agreed conclusions, rather than letting them fester as they did in the US. This bolsters Goodman's appraisal of the JIC, that its strength at this time owed much to its being 'driven by a desire to achieve consensus'.[176] The correct distance between intelligence and policy is also a difficult but valuable position to find, and the bomber intelligence episode shows the perils of getting this wrong, and the rewards of getting it right. Huw Dylan concludes that the lesson of British and American experiences of the 'missile gap' is that 'assumptions and the basis upon which they are held' should be questioned 'thoroughly and regularly'.[177] This is also the lesson from their performance during the 'bomber gap' era, but the following maxim can be added: ask what those who hold an assumption stand to gain by doing so.

[174][www.historyandpolicy.org, 24 April 2016] Christopher Andrew, 'Intelligence Analysis Needs to Look Backwards before Looking Forward', *History and Policy*, (2004).
[175]The classic example being Richard K. Betts, 'Analysis, War, and Decision: Why Intelligence Failures are Inevitable', *World Politics*, 31/1 (1978), 61.
[176]Goodman, *Official History*, 423.
[177]Dylan, 'Britain and the Missile Gap', 801.

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