

Military identities, conventional capability and the politics of NATO standardisation at the beginning of the Second Cold War, 1970-1980

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ABSTRACT

This paper uses equipment standardisation as a lens for examining power relationships and the importance of military identity in framing the development of NATO conventional capability. In the face of the Warsaw Pact's overwhelming military capacity the logic of standardisation was compelling. Standardising equipment and making military forces interoperable reduced logistics overlap, increased the tempo of operations and allowed partners to optimise manufacturing capacity. Applied carefully, standardisation would help NATO mount a successful conventional defence of Western Europe, a crucial aspect of the Alliance's flexible response strategy. In this paper we apply Actor Network Theory to standardisation discussions thereby revealing the incoherence and volatility of NATO's collective strategic thinking and the vast networks of countervailing interests on which this is based.

Keywords:

NATO standardisation, alliance politics, defence industrial policy

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If the possession of nuclear weapons constitutes the high politics of the North Atlantic Treaty Organisation (NATO), then the standardisation of conventional equipment must surely represent the low politics of the Alliance's Brussels-based bureaucracy. During the 1950s and 60s discussions within NATO were concerned with balancing European and US security concerns as they related to extended nuclear deterrence and whether to rebuild West German military capacity.¹ While Europeans wanted reassurance that the Americans were committed to using their nuclear arsenal in the face of Soviet aggression, the United States was keen to build a firebreak into their deterrence strategy. This involved upgrading European conventional forces in the hope that war could be limited to a conventional level and the rush to use nuclear weapons prevented.² Eventually known as Flexible Response, Europeans (especially the British and West Germans) felt that planning for a prolonged conventional war would undermine deterrence 'by making it appear less likely that nuclear weapons would be used'.³ As long as Europeans focused their attention on the grand politics of nuclear deterrence, the challenge of producing interoperable conventional forces capable of holding back a Soviet invasion was of secondary importance.

Following their withdrawal from Vietnam, however, the US military refocused its attention on what it decided was its core mission: the defeat of Warsaw Pact forces on the plains of West Germany. Eventually resulting in the 1980s doctrine of Air-Land Battle, the United States spent much of the 1970s identifying the technological means that would allow their armed forces to defeat advancing

¹ C. Bluth, "Reconciling the Irreconcilable: Alliance Politics and the Paradox of Extended Deterrence in the 1960s," *Cold War History* 1, no. 2 (2001); J. S. Corum, "Building a New Luftwaffe: The United States Air Force and Bundeswehr Planning for Rearmament, 1950-60," *Journal of Strategic Studies* 27, no. 1 (2004). S. Moody, "Enhancing Political Cohesion in Nato During the 1950s Or: How It Learned to Stop Worrying and Love the (Tactical) Bomb," *ibid.* 39(2015).

² L. Freedman, *The Evolution of Nuclear Strategy* (Basingstoke: Palgrave Macmillan, 2003). pp. 271-273. 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, 1977-1979," *Journal of Cold War Studies* 13, no. 2 (2011). S. Huntington, "Conventional Deterrence and Conventional Retaliation in Europe", *International Security*, 8 no. 3 (1983-1984).

³ Bluth, "Reconciling the Irreconcilable: Alliance Politics and the Paradox of Extended Deterrence in the 1960s." p. 94. For a fuller explanation of the different ways Flexible Response was interpreted see, B. Heuser, *NATO, Britain, France and the FRG: Nuclear Strategies and Forces for Europe, 1949-2000* (London: Macmillan, 1997).

Soviet armies even before they arrived at the forward edge of the battlefield.⁴ With America's senior commanders firmly fixed on the conventional defence of West Germany, the European powers of NATO subsequently found themselves under renewed pressure to upgrade their conventional forces.⁵ This reinvigorated a process of equipment standardisation that had in many respects previously failed to deliver on the promises that politicians, defence planners and economists had suggested were possible over the previous thirty years.⁶

Although most scholarly interest has concentrated on the management of the Alliance's nuclear forces, this paper switches attention to the problem of creating conventional capability from the armed forces of 15 different nations at the start of the second Cold War. From the beginning of the alliance's formation NATO powers understood the importance and benefits of interoperability and burden-sharing for producing conventional armed forces that had a chance of standing up to the overwhelming numerical strength of the Soviet Union. Crucial to this project was the standardisation of policies, procedures, tactics and technology between Alliance partners. Without agreed protocols on everything from map symbology and communication procedures to the type of headphone jack or small arms (SA) and small arms ammunition (SAA) being used at the frontlines – particularly as it related to assault rifles and machine guns – NATO's ability to defend itself with conventional forces would be severely curtailed.

Invariably overlooked by those interested in military-technical change and alliance theory, this paper shows how mundane artefacts constructed and reflected power relations across NATO. NATO's civilian and military bureaucrats established a procedural framework for producing standardisation agreements, known as STANAGs. STANAGs formed the basis through which interoperable forces could be established. Understandably dry and focused on the minutiae of

⁴ B. Lynn, *The Echo of Battle - the Army's Way of War* (Cambridge, Mass: Harvard University Press, 2007). pp. 173-233.

⁵ In 1978, NATO approved the Long-term defence program, which provided additional impetus to the upgrading of conventional forces in Europe. A final communiqué of a meeting of NATO's Defence Planning Committee in 1978 specifically highlighted the significance of efforts to 'improve the standardization and/or inter-operability of defence equipment'. See Final communiqué, Defence Planning Committee, 1978, Item 12, NATO On-line library, accessible at <https://www.nato.int/docu/comm/49-95/c780518a.htm>, accessed 27.2.2018

⁶ Keith Hartley, "Nato, Standardisation and Nationalism: An Economist's View," *RUSI: Royal United Services Institute for Defence Studies, Journal* 123, no. 3 (1978).

definitions and technical specification, these agreements represent an insight into NATO thinking along a number of dimensions: from the place of the infantry in the defence of Western Europe, to defence industrial policy.

Whereas most discussions of alliance relationships tend to focus on IR theory or Political Economy as a vehicle for exploring member state behaviours, the approach adopted here draws on science and technology studies.⁷ Standardisation agreements between NATO partners offer a rich location for charting the values of those actors, values that define acceptable and unacceptable socio-technical practices.⁸ By tracing the socio-technical bargains that underlie STANAGs it becomes possible to learn something about the mechanics of power within the Alliance. To make this fully transparent this paper draws on Actor Network Theory (ANT), particularly the work of Bruno Latour,⁹ and applies it to the emergence of new SA and SAA STANAGs in the 1970s. ANT collapses material and social variables into one register, laying bare the networks of power that framed the arrival of new SA and SAA STANAGS. As a consequence, ANT helps identify how resistance can work in ways that undermine established dominant networks, a perspective that is particularly useful when discussing changing patterns of relations between NATO powers in the 1970s and early 1980s.

This analysis also has the virtue of avoiding the trap of assessing technology change in reference to a technical end point. Instead, this paper reminds us that there is no such thing as a neutral technological goal but rather that the process by which technical priorities are established is itself a social and political one.¹⁰

⁷ On IR Theory see, A. Thompson, "Coercion through Ios: The Security Council and the Logic of Information Transmission," *International Organization* 60, no. 1 (2006); D. Bearce and S. Bondanella, "Intergovernmental Organizations, Socialization, and Member-State Interest Convergence," *ibid.* 61, no. 4 (2007). With regards to political economy see, for example, the work by Professor Ethan Kapstein, a specialist in political economy, who has written about the contemporary distribution of power within NATO through the lens of military R&D. See E. B. Kapstein, "Allies and Armaments," *Survival* 44, no. 2 (2002); "International Collaboration in Armaments Production: A Second Best Solution," *Political Science Quarterly* 106, no. 4 (1991-92). Hartley, "Nato, Standardisation and Nationalism: An Economist's View;" "Defence Industrial Policy in a Military Alliance," *Journal of Peace Research* 43, no. 4 (2006).

⁸ The issue is examined in a number of non-military papers in the edited volume, D.L. Kleinman and K. Moore, eds., *Routledge Handbook of Science, Technology and Society* (London: Routledge, 2014).

⁹ B. Latour, "Where Are the Missing Masses? The Sociology of a Few Mundane Artefacts," in *Shaping Technology/Building Society: Studies in Sociotechnical Change*, ed. W. E. Bijker and J. Law (Cambridge, Mass: MIT Press, 1992).

¹⁰ This is reflected in the work of D. Bloor, "Sociology of Scientific Knowledge," in *Handbook of Epistemology*, ed. I. Niiniluoto, I. Sintonen, and M. Wolenski (Netherlands: Springer, 2004); "Idealism and the Sociology of Knowledge," *Social Studies of Science* 26, no. 4 (1996).

With this in mind, it would be inaccurate to characterise standardisation as the technical ideal, and all deviation from it as patterned by social factors. In NATO's own sociotechnical web, standardisation was not value-free but rather it was a means by which an Alliance partner or network could establish hegemonic control through the imposition of political and strategic cohesion. At the same time, small arms are foundational to the military-cultural identities of those who use them. It has often been acknowledged, for example, that rifles' technical and aesthetic qualities bear the cultural hallmarks of their developers. The AK-47's ergonomics and ease of use were representative of the values of socialism and collectivism.¹¹ Bearing this in mind, it is an open question as to how small arms as sources of military identity affected standardisation in NATO.

This paper shows that despite the NATO-wide imperative to standardise small arms and ammunition none of the dominant actors in NATO were willing to compromise on socio-technical priorities, often hinging on range and lethality. Countries were determined to ensure that standardisation occurred on terms favourable to them; this meant designing their own weapon system and attempting to persuade other NATO members that their solution was best. Thus, while the United States had an established 5.56mm round and M16 rifle that they had used in Vietnam, the Federal Republic of Germany (FRG) was designing a caseless 4.7mm round and G11 rifle that would reduce the weight of equipment carried by soldiers by as much as 20%. Meanwhile the British were developing their own small calibre 4.85mm round and service rifle to fire it. All three powers recognised that small arms standardisation was a means by which political goals could be advanced and national preferences maintained.

This paper will focus primarily on the patterns of thought and interactions between the three dominant NATO actors who were proposing their own technical solutions - the United States, the FRG and the United Kingdom - as they geared up to trial new ammunition and weapons in the late 1970s. Despite the weight of research and development invested in a future round by the 'big three', the paper will finish by introducing the Belgian arms manufacturer - *Fabrique Nationale* (FN) - that succeeded in advancing its own ammunition as standard over and above the others.

¹¹ C. J. Chivers, *The Gun* (New York: Simon & Schuster, 2011).

After introducing Actor Network theory and outlining the standardisation agenda in NATO, this article will examine the construction of social-technical preferences in small arms systems in each of NATO's major defence producers, before discussing the broader, oppositional socio-technical network in which small arms standardisation became embedded over the course of the Cold War. The resulting analysis offers insights into the vast networks of countervailing interests that guide military technological development and presents an alternative interpretation of NATO politics and conventional military effectiveness beyond a focus on nuclear deterrence.

Actor Network Theory

Actor Network Theory (ANT) helps us to navigate our way through the various complex sociological forces that shaped and framed the standardisation debates in the 1970s. Emerging out of the work of Bruno Latour and Michel Callon, ANT is now a mainstream mode of inquiry in the sociology of technology.¹² Varying in empirical and theoretical content, there is a rich literature that has applied ANT to everything from experimentation in biometric testing of refugees to how Britain might relinquish nuclear weapons.¹³ To date, however, ANT has not been applied to military-industrial matters within NATO.

In contrast with the work of those approaches that draw on IR Theory or Political Economy, an investigation derived from ANT does not take economic, social or political interests as fixed. Instead, ANT sets out to develop a sociological analysis that lays bare the process by which these interests emerge. Callon and Latour do this by identifying how individual micro-actors are enrolled into a single collective

¹² M. Callon and B. Latour, "Unscrewing the Big Leviathan: How Actors Macro-Structure Reality and How Sociologists Help Them to Do So," in *Advances in Social Theory and Methodology - Towards an Integration of Micro- and Macro-Sociologies*, ed. K. Knorr-Cetina and A.V. Cicourel (London: Routledge & Kegan Paul, 1981); M. Callon, "The Sociology of an Actor Network: The Case of the Electric Vehicle," in *Mapping the Dynamics of Science and Technology*, ed. M. Callon, J. Law, and A. Rip (London: Macmillan, 1986).

¹³ K. L. Jacobsen, "Experimentation in Humanitarian Locations: Unhcr and Biometric Registration of Afghan Refugees," *Security Dialogue* 46, no. 1 (2015); N. Ritchie, "Relinquishing Nuclear Weapons: Identities, Networks and the British Bomb," *International Affairs* 86, no. 2 (2010). For a more rounded perspective on how ANT can be applied in the field of International Relations, see A. Barry, "The Translation Zone: Between Actor-Network Theory and International Relations", *Millennium: Journal of International Studies* 41, no. 3 (2013).

will. Their goal is to explain the translation process these micro-actors use to agree the perspectives of others in such a way as to transform themselves, Leviathan-like, into legitimate macro-actors who can dictate socio-technical outcomes.¹⁴ These macro-actors then pass off these interests as established and pre-determined when in practice they are micro-reifications of the perspectives of a collection of actors who have been enrolled into their network.¹⁵

Recognising that durable, or material, considerations play a part in shaping the emergence of the macro-actor, ANT eschewed deterministic analyses that implied a difference between the social and the technological.¹⁶ Instead, Latour and Callon asked sociologists to identify how actors went about creating associations between the material and the social to form networks of power.¹⁷ Aware that these networks were constantly in flux, being built and re-aligned as actors became enrolled in the maintenance of a socio-technical system, ANT offers a vehicle for exploring how rival networks emerge and resist macro-actors. Thus Actor Network Theory asks scholars to engage with socio-technical change in ways that can help explore the balance of forces enrolled in producing particular sets of power relations at any one point in time.

The key to a research programme that embraces ANT is to be attentive to how actors are enrolled into these wider networks. Specifically, it asks us to describe how alliances between actors emerge through a number of strategies that in effect shape, fix and secure the concerns of micro-actors into macro-networks. For Callon these strategies amount to a process of translation such that actors find ways to work together to resolve particular problems. The starting place for this involves one actor problematising a particular issue and setting themselves up as the focal point for defining potential solutions to that scenario. This central actor seeks to show how they are indispensable to other actors who agree with their characterisation of the problem. Having done this the central actor attempts to convince others that the solutions that they have identified ought to constitute the

¹⁴ Callon and Latour, "Unscrewing the Big Leviathan: How Actors Macro-Structure Reality and How Sociologists Help Them to Do So."

¹⁵ M. Callon and J. Law, "On Interests and Their Transformation: Enrolment and Counter-Enrolment," *Social Studies of Science* 12, no. 4 (1982).

¹⁶ Callon, "The Sociology of an Actor Network: The Case of the Electric Vehicle."

¹⁷ "Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fisherman of St. Brieuc Bay," in *Power, Action and Belief*, ed. J. Law (London: Routledge and Kegan Paul, 1986).

obligatory passage point through which everyone must pass. Assuming the micro-actors can be persuaded or enrolled into this network then the focal actor puts in place various methods for ensuring that the network complies with the agreements that have been reached.

As will become apparent, given the way in which the debates on SA and SAA unfolded during the 1970s, ANT offers a useful lens through which we can develop more insightful analyses of NATO's politics of standardisation. Our starting place involves exploring the problem of standardisation as it was understood in the 1970s. By examining military, engineering, industrial and material actors in the UK, US and the FRG we can then lay bare the strategies employed to produce socio-technical agreement on future SA/SAA standardisation. This approach also ensures that we can properly identify the way networks of resistance were mobilised through competing actor networks.

The politics of NATO standardisation in the 1970s

The need to standardise equipment, weapons and doctrine in NATO was recognised as a strategic imperative from the onset of the Cold War. As Eliot Cohen noted in an article in *Foreign Policy* in 1978, 'non-standardised armies require unique and separate supply lines, making wide-ranging manoeuvres difficult... such armies must stock different types of spare parts: their logistics are therefore complicated and the number of support troops they require is wastefully large' and that furthermore 'neighbouring troops of different nationalities cannot supply each other with spare parts'.¹⁸ A letter written to the British leader of delegation to the North Atlantic Assembly in 1979, likewise, asserted that Rationalisation, Standardisation and Interoperability (RSI) was a 'route to more coherent alliance defence',¹⁹ while senior British civil servants at the MOD also acknowledged that interoperability would provide substantial 'logistic advantage'.²⁰ As a House of

¹⁸ E. Cohen, "Nato Standardization: The Perils of Common Sense," *Foreign Affairs*, no. 31 (1978), p. 75

¹⁹ B.M. Webster (Head of IP2), *Draft Letter to Patrick Wall, 1978*, DEFE 13/1167 – Interoperability and Standardisation of Equipment in NATO (1978/1979), The National Archives, Kew. This collection includes many of the documents pertaining to the British dimension of NATO SA standardisation during a crucial two-year period between 1977 and 1979.

²⁰ VHB Macklen, *DUS (P), 20 January 1978*, DEFE 13/1167 – Interoperability and Standardisation of Equipment in NATO (1978/1979).

Commons Report noted, the lack of standardisation in NATO was in stark contrast to Warsaw Pact forces, which [in 1977] enjoyed total 'uniformity of doctrine, training, and equipment'.²¹ Indeed, a report by the Center for Strategic and International Studies (CSIS) in 1979 argued that increasing standardisation and interoperability were the only mechanism by which the 'conventional force balance' between NATO and the Warsaw Pact could be maintained.²²

Key to materiel RSI was the achievement of universal or compatible tactical concepts within NATO armies. If tactical preferences could be harmonised across the Alliance, then one user requirement could be produced and a weapon system developed to satisfy this specification. This implied that the use of 'common or compatible tactical doctrine with corresponding organisation compatibility' was a significant aspect of the overall rationalisation of NATO defence.²³ Thus, a memo written to Britain's Minister of State for Defence in 1978 noted that 'the first step [of RSI] is to rationalise tactical concepts with other nations, because without such rationalisation there can be little prospect of agreement on weapon characteristics, or subsequently on weapon design or production'.²⁴ In response to this growing demand to harmonise tactics, NATO's Conference of National Armaments Directors was charged with identifying 'common [operational] requirements and coordinate efforts to achieve cooperation'.²⁵

However, there was also a strong economic case for RSI in NATO. As was asserted in a CSIS newsletter concerning missile systems, 'money can be spent wastefully developing eight different missiles, which can then only be procured in small quantities at high unit cost. Or it can be spent efficiently developing one standardised missile, which can then be bought in large quantities at low unit cost'.²⁶ In 1976, one American commentator estimated that duplicative R&D and

²¹ *Official Report, House of Commons, Vol. 926, Col 540/41 – 22/2/77 (Written)*, DEFE 13/1167 – Interoperability and Standardisation of Equipment in NATO (1978/1979)

²² Transatlantic Policy Panel, 'Allied Interdependence Newsletter', *The Center for Strategic and International Studies, No. 9 (March 1979)*, DEFE 13/1167 – Interoperability and Standardisation of Equipment in NATO (1978/1979).

²³ *Ibid.* pp. 3-7.

²⁴ Loose Minute, Minister of State's Office, 13 February 1978, DEFE 13/1167 – Interoperability and Standardisation of Equipment in NATO (1978/1979)

²⁵ DUS (POL) PE/90/8/2/12, Minister of State, DEFE 13/1167 – Interoperability and Standardisation of Equipment in NATO (1978/1979)

²⁶ Transatlantic Policy Panel, 'Allied Interdependence Newsletter', *The Center for Strategic and International Studies, No. 9 (March 1979)*, DEFE 13/1167 – Interoperability and Standardisation of Equipment in NATO (1978/1979).

logistics systems and inefficient production cost NATO around \$10bn annually, while some commanders gave a figure of \$15bn;²⁷ more than this, however, attaining standardisation was seen as essential to maximising the production and R&D potential of NATO's European members.

From an early stage, however, efforts to achieve standardisation and interoperability were stymied for a variety of reasons. According to British civil servant, Michael Quinlan, NATO Basic Military Requirements (which set out doctrinal guidelines for RSI) were both 'unrealistic and inflexible'.²⁸ Other MOD personnel cited the unwillingness of the US Armed Forces to change their tactical doctrines to fit in with those of European NATO members as a significant barrier to armaments cooperation. By contrast, some thought that the only real prospects for RSI lay in cooperation initiatives between two or three NATO member states, where there could be reasonable expectations of doctrinal homogeneity.²⁹

Although there was also disagreement between NATO member states on the industrial implications of small arms RSI, the most significant points of conflict (at least on the surface) concerned the lethality, range and weight of the new small arms system. The remainder of this article will highlight how debates over the ostensibly mundane technical details in small arms RSI illustrated not only the diversity and volatility of strategic interests within the alliance, but also the longstanding layering of technological development (in an alliance-wide network) between national identity and the broader economic considerations of materiel standardisation. This analysis will be divided into two sections. As first point of inquiry, it will analyse the construction of technical priorities within each of the three most influential voices on small arms development in NATO – the US, UK and Germany. Subsequently, it will investigate how these differences, while not intractable, had become integrated into relational networks between the powers that made achieving a consensus on one of their preferred options all but

²⁷ For the \$10bn figure see Dan Daniel, NATO Standardisation, Interoperability and Readiness: Report of the Special Subcommittee on NATO RSI of the Committee on Armed Services House of Representative with Additional Views, 95th Congress, Second Session, p. 13, DEFE 13/1167 – Interoperability and Standardisation of Equipment in NATO (1978/1979). For the \$15bn see Committee of Armed Services, United States Senate, 'Report on Authorising Appropriations for Fiscal Year 1977', Ezell Gun Collection.

²⁸ Memo written by M.E. Quinlan, 16 January 1978, DEFE 13/1167 – Interoperability and Standardisation of Equipment in NATO (1978/1979)

²⁹ DUS (POL) PE/90/8/2/12, Minister of State, DEFE 13/1167 – Interoperability and Standardisation of Equipment in NATO (1978/1979).

impossible. Ultimately, it was only the Belgian arms manufacturer FN FAL that was able to achieve a degree of compromise within the network.

The United States

America was the arsenal of democracy during the Second World War and to a large degree, remained *primus inter pares* within NATO during the Cold War. Structural and material advantages might have suggested that the United States would become the central actor around which a socio-technical network might emerge. However, it did not follow that the rest of NATO would accept the US position on standardisation.

The US small arms establishment had itself been racked by disagreements over rifle development, which had industrial, financial, political and reputational ramifications. The selection of the M16 in 1964 had, for example, been controversial for a number of reasons. Known as the black rifle, because it was acquired outside the usual procurement process, the M16 was initially ignored in senior circles within the US Army because they favoured the M-14.³⁰ Adopted in 1957, the M-14 represented a bargain between the US Army Ordnance Corps, the Army's traditional advisors on equipment selection, and those senior officers that remained wedded to the kinds of marksmanship traditions that were embodied by the Springfield Rifle and latterly the M-1 Garand from the First and Second World Wars.³¹

It was this tradition of marksmanship that linked technological development and the intangibles of military and national identity in US small arms development. Marksmanship emphasised the ability of soldiers to strike targets at ranges between 600m and 900m, and the engineering solutions that had been developed to realise this objective meant designing a weapon that could fire large .30'06 calibre ammunition. The .30'06 round had in turn formed the basis for 7.62mm ammunition, which NATO adopted in 1957 and was used in the M-14. Committed to this calibre, US officers flatly refused to consider alternatives during SAA

³⁰B. R. Stevens and E. Ezell, *The Black Rifle: M16 Retrospective* (Cobourg, Ontario: Collector Grade Publications, 1992).

³¹T. McNaugher, *The M16 Controversies – Military Organisations and Weapons Acquisition* (New York: Praeger, 1984).

standardisation debates in the 1950s stating that any standardised round 'must have the wounding power, penetration performance and ballistics at least equal to that in use today'.³²

Transferring institutional allegiance from older rifles to the M16 nevertheless demanded the production of new myths if the US Army was going to embrace another weapon and survive the inevitable criticism that would come about from changing equipment so quickly after adopting the 7.62mm round and the M-14. In this respect, for those who believed the Ordnance Corps had been betrayed and the professional shooting ideals of the infantry undermined, the M16 was a Mattel weapon. But for those who wanted to keep the infantry relevant in a future dominated by nuclear weapons, the switch was about increasing the lethality of the infantry.

Initially used in Vietnam, the logic of lethality as a founding myth worked spectacularly well all the while reports about the M16 emphasised the dramatic effects of 5.56mm ammunition on enemy combatants.³³ These reports were, however, sustained by an active marketing campaign engineered by Eugene Stoner, the lead designer of the M16, and Colt Industries, the new owner of the production license after ArmaLite sold its rights to the weapon. According to Stoner and Colt the tumbling action of the purpose-built 5.56mm ammunition demonstrated that the M16 was 'the most lethal rifle the world had known'.³⁴ This was backed by US Department of Defense analysis known as Project AGILE in August 1962. According to C.J. Chivers the analysis was conducted along scientifically dubious grounds in order to support the case for the M16's introduction.³⁵ Nevertheless, the final Project AGILE report laid out the wounding power of the new 5.56mm round in all its gory detail; 'back wound, which caused the thoracic cavity to explode', 'buttock wound, which destroyed all of the tissue of both buttocks', 'heel wound, the projectile entered the bottom of the right foot causing the leg to split from the foot to the hip'.³⁶ Whether 5.56mm ammunition was an effective round was almost irrelevant. For those trying to engineer new

³² E. Ezell, *The Great Rifle Controversy: Search for the Ultimate Infantry Weapon from World War 2 through Vietnam and Beyond* (Harrisburg, Pa.: Harrisburg 1984), pp. 92-93.

³³ Chivers, *The Gun.*, p. 282.

³⁴ *Ibid.*, p. 283.

³⁵ *Ibid.*, p. 276.

³⁶ *Ibid.*, pp. 282-283.

loyalties to the M16, the ambitions were simple. If the Infantry were to remain relevant then they had to embrace modern weapons.

Creating a sense of loyalty to the M16 was no doubt made harder by the way it suffered catastrophic failures in the mid-1960s while in action with American GIs in Vietnam. Initially put down to GI's poor cleaning regimes, the M16 subsequently underwent several separate investigations (by the Army, DoD, Colt and Congress) all of which had the effect of passing the blame between agencies. Conveniently for the supporters of the M16, however, the Ordnance Corps could be blamed for changing the type of propellant contained in the 5.56mm SAA that culminated in the weapon's failure in Vietnam. With the Ordnance Corps discredited it became increasingly hard for those who wanted to retain the M-14 – and the traditions of marksmanship it implied – to sustain their position.

Nevertheless, switching to the M16 clearly undermined the stated US foreign policy goals of standardisation within NATO. By 1976 these had been embedded into various pieces of legislation such as the Culver-Nunn amendment to the Department of Defense Appropriation Authorisation Act. Once called the 'most authoritative statement of policy by any NATO ally regarding standardisation and interoperability', this stated that all equipment procured for Europe-based US personnel 'should be standardised or at least interoperable with equipment of other members of NATO', and that 'the Secretary of Defense shall, to the maximum feasible extent initiate and carry out procurement procedures that provide for the acquisition of equipment which is standardised or interoperable'.³⁷

Although the US had signed a 1976 Memorandum of Understanding (MOU) with other NATO powers agreeing to hold and abide by trials that would determine a future standardised SAA round, the potential economic implications of adopting a calibre other than 5.56mm remained unwelcome. Unlike many of NATO's European member states, the US Army had staked a great deal of its reputation in the M16 and saw no benefit from switching to another system especially when, according to Edward Ezell, the cost of doing so might amount to around \$360m.³⁸

³⁷ Transatlantic Policy Panel, 'Allied Interdependence Newsletter'. p. 10.

³⁸ Ezell, *The Great Rifle Controversy: Search for the Ultimate Infantry Weapon from World War 2 through Vietnam and Beyond.*, p. 270.

Given their commitment to 5.56mm SAA the Americans were therefore very keen to find ways to persuade their European allies that they too should adopt the new US ammunition as a standard. Having committed so much political, financial and social capital to the procurement of the M16 switching to an alternative weapon system would be extremely painful for American policymakers. Notwithstanding the humiliation of discarding a service rifle so soon after adopting it, the M16 represented a historic (though evolving) tradition of American soldiering. More than being a technical solution to the US's individual warfighting needs, its preferences on range and lethality were *socially* constructed over a long period. The next part of this article will explore the socio-technical priorities of the Federal Republic of Germany and the United Kingdom.

The Federal Republic of Germany

The *Bundeswehr* had very much bought into the RSI benefits of adopting the 7.62mm cartridge when it adopted the FN FAL (designated the G1 rifle) in 1956. However, after the standardisation trials of 1979-80, trials that had been brought about by the signing of the 1976 MOU, the FRG was the only major arms producer in the Alliance to reject RSI in favour of their own prototype weapon and ammunition. Instead of adopting the American 5.56mm round, the FRG decided to hold off making changes in the hope that they could re-equip with the far lighter, caseless 4.7mm G11 rifle. At prototype stage by the time of the trials, the FRG hoped it would be ready for combat service at some point in the late 1980s. The G11, designed and developed by a consortium of German manufacturers that included Heckler and Koch, was built around experimental and potentially revolutionary ammunition. Without a brass cartridge case, the 4.7mm round significantly reduced soldier burden and had the potential to revolutionise the tactical engagement. Unfortunately, the weapon suffered a number of faults during the trials and was withdrawn prematurely. Given that the FRG had signed the 1976 MOU on SA/SAA standardisation, however, the *Bundeswehr's* decision not to adopt the eventual winner of the trials demands some exploration.

Within a few short years of adopting the 7.62mm NATO round, opinion in the *Bundeswehr* had turned fairly decisively against this cartridge in favour of smaller and lighter weapons and ammunition. At a meeting in February 1967, FRG officers

stated that they believed the 'main weakness of modern weapons was over-powerful ammunition', and that the FRG would be better served by a smaller, lighter weapon chambered for a cartridge of between 4.5 and 4.8mm in size.³⁹

This reflected the *Bundeswehr's* thinking on mechanised infantry; specifically, a view that Infantry Fighting Vehicles (IFV) should be able to fight *en route* to an objective, and that infantry should be able to engage the enemy from within their armoured vehicles.⁴⁰ The origins of this type of armoured vehicle can be traced back to the Second World War, and in many respects reflect Germany's unique battlefield environment.⁴¹ 20% of the FRG's population and 16% of its industry were located in a small, 50km-wide strip of land on its Eastern border. 30% of the country's land was forested, and most importantly, exposure lines (straight lines in terrain permitting unobstructed view) were restricted to under 600m across 70% of the country's area.⁴² With their greater mobility, mechanised infantry units possessed a flexible combat capability, which could fight its way on to the objective. Recognising the complexity of the forested terrain and restricted exposure lines, the FRG IFV – known as the Marder – was designed with a 7.62mm coaxial machinegun on the top but featured fire-ports for the infantry squad to shoot from while they were inside it.⁴³

In order to further optimise mechanised infantry, the *Bundeswehr* were on the lookout for a service weapon that would allow them to operate more effectively from the Marder. Envisaging a weapon that 'could replace both rifles and sub-machine guns, and possibly pistols in as well' German officers noted that the *Rheinmetall* G3 rifle which (following disputes with *Fabrique Nationale*) replaced the G1 in 1959 was no longer acceptable.⁴⁴ The G3 was too long and too heavy to allow infantry to use their weapon while inside the Marder and was not suitable

³⁹ Annex A to A/70/SA/126, 'Review of National Trends of Interest Towards A New Light Personal Weapon', 5 February 1969, WO 32/21452 – Advanced Weapons – Concept Group Rifles, 1967.

⁴⁰ Annex to DUS (P) 44/78, 16 January 1978, DEFE 13/1167 – Interoperability and Standardisation of Equipment in NATO (1978/79).

⁴¹ W. Blair Haworth Jr., *The Bradley and How It Got That Way: Technology, Institutions, and the Problem of Mechanized Infantry in the United States Army* (London: Greenwood Press, 1999), p. 14.

⁴² D. Gates, "Area Defence Concepts: The West German Debate," *Survival* 29, no. 4 (1987).

⁴³ R.G. Sawhney, "Trends in Design and Employment of Tracked Infantry Combat Vehicles," *Strategic Analysis* 7, no. 10 (1984), p. 869.

⁴⁴ Report of a Visit to FRG MOD, Bonn on 2 January 1969 by Lt. Col. R.M. Porter, 5 February 1969, WO 32/21452 – Advanced Weapons – Concept Group Rifles, 1967.

for urban, forested and close range environments characteristic of the FRG battlespace. As a result, by 1969 one British officer observed that the *Bundeswehr*, 'are already replacing G3 rifles with SMGs [sub-machine guns] in some of their mechanised infantry battalions'.⁴⁵

This imperative intensified during the 1970s, when the Soviet Union drastically strengthened its mechanised infantry capability. In 1973, the Red Army introduced a new armoured personnel carrier and infantry combat vehicle which 'greatly increased the mobility, flexibility and fire power of infantry units' and increased the manpower of motor rifle divisions by around 20%.⁴⁶ As English accounts in *On Infantry*, 'whereas the ratio of tank to motor rifle divisions in the Red Army was 1:1.8 in the early 1960s, it had been reduced to 1:2.2 by 1974'.⁴⁷ If the Red Army hoped to execute a rapid general move forward to pin NATO forces the FRG's mechanised infantry units would be crucial to slowing down and helping to repel an incursion.⁴⁸

Herein lay the attractiveness of a prototype G11 rifle which was over 10 inches shorter than the M16, and had ammunition weighing around half as much as the American 5.56mm brass-cased round. The FRG, unlike the British and Americans, had long placed more emphasis on the hit probability benefits of lighter, smaller calibres than the additional range and lethality of full-power rifle cartridges. In 1969 the *Bundeswehr* believed 'hit probability was, within reasonable limits, more important than lethality'.⁴⁹ If riflemen were 'not very effective at hitting targets beyond about 300m', FRG officers argued that a 'low-performance, light, small-calibre weapon should enable quick and accurate aiming'.⁵⁰ A *Bundeswehr* study from the late 1960s had found that although German soldiers scored only 10% hits against man-sized targets at normal battle ranges, around 40% of shots fired were within a '10cm periphery' of the targets.⁵¹ Under these circumstances a salvo

⁴⁵ Ibid.

⁴⁶ Ministry of Defence, 'Increases and Improvement in Soviet Ground Forces', DEFE 31/153 – Eastern Europe, Soviet/Warsaw Pact – Strategy and Doctrine (1972-1973).

⁴⁷ English, J., *On Infantry* (New York: Praeger, 1984), p. 195.

⁴⁸ Ministry of Defence, 'Increase in the Capabilities of Soviet General Purpose Ground and Air Forces 1967-1972', 16 July 1973, p. 27, DEFE 31/153 – Eastern Europe, Soviet/Warsaw Pact – Strategy and Doctrine (1972-1973).

⁴⁹ Report of a Visit to FRG MOD, Bonn on 2nd January 1969 by Lt. Col. R.M. Porter, 5 February 1969, WO 32/21452 – Advanced Weapons – Concept Group Rifles, 1967.

⁵⁰ Ibid.

⁵¹ Ibid.

capability would be more effective than precision fire.⁵² With its small size, lightweight, unique burst fire capability and caseless 4.7mm cartridge, the G11 system was intended to compensate for poor soldier shooting performance and offer more operational flexibility in the face of what was presumed to be an overwhelming Warsaw Pact capability. Finding ways to enrol the Germans into a network that supported 5.56mm SAA would, therefore have to overcome the Bundeswehr's increasingly fixed perspective on the tactical utility of the Marder and the G11 rifle.

The United Kingdom

While the United States were investing heavily in 5.56mm ammunition and the M16, Britain's design capability had been put into full decline after the decision to abandon their own experimental rifle, known as the EM2, in 1953. Since the 1940s British engineers had established that the full-power SAA in service at the time was ill suited to the realities of modern combat. The ammunition meant weapons had to be built that were too heavy and cumbersome for the relatively short ranges at which the majority of infantry engagements took place. Given that a Labour government had actually declared in 1951 that it would adopt the EM2 as the Rifle No.9 Mk1 a considerable amount of political capital had been invested in the future small arms that the British Army would use. In many respects this continued to overshadow much of the decision-making associated with small arms even up to the 1970s and beyond.

Following the decision to abandon the EM2, however, British opinion turned fairly decisively against the potential standardisation of a small calibre cartridge. Despite previous support for smaller, high-velocity ammunition, the US adoption of the 5.56mm and its new M16 rifles heralded a period of intense concern in the British military establishment. In April 1969, Lieutenant General George Lea,

⁵² The concept of SALVO suggests that weapons with extremely high-rate burst fire (>2000 RPM) can achieve higher hit probabilities than fully-automatic weapons, by ejecting three or more rounds before any recoil is felt by the shooter. It became synonymous with the development of caseless ammunition, particularly during the US Advanced Combat Rifle project during the 1980s. See Shisler, Mango, 'Advanced Combat Rifle (ACR) Program, Volume III, ACR User, Manuals, *Joint Service Small Arms Program*, February 1992, Ezell Gun Collection.

Britain's Defence Attaché in Washington DC stated that 'an early move to 5.56mm by the US would undoubtedly have serious repercussions for us'.⁵³

Although it was noted that 'it is technically possible to improve the performance of the present US 5.56mm cartridge' there was little interest in pursuing such a solution within the British Army and switching away from existing 7.62mm weapons.⁵⁴ In practice, in the late 1960s the benefits of switching to 5.56mm SAA was uncertain – especially as the Americans had been investigating new ammunition types as part of a project known as SALVO. The potential then to adopt 5.56mm just as the Americans switched to a new calibre was therefore a significant institutional break in the mind of Britain's military-bureaucratic decision makers. In this respect, the British opposition to 5.56mm carries all the hallmarks of an embedded technical preference, where a previous decision forms the backdrop for years of technological decision-making.

In 1979, however, the UK submitted an even smaller round (the 4.85x49mm) to the NATO trials. Rather than reflecting a resurgent desire to standardise SAA, these decisions resulted more from the technical imperatives arising out of operations in Northern Ireland. The beginning of the Troubles in 1969 and coincident civil disobedience in the United States prompted a period of intense re-examination of equipment and tactical doctrine in the British Armed Forces. As one MOD paper, published in 1970, put it,

The situation in Northern Ireland and examples of internal unrest in the United States are pointers to the changing nature of civil disturbance to which the British Army must adapt. Crowds may consist of determined rioters over 5,000 strong who may not be easily dispersed. Women and children may be placed in the forefront of crowds. Troops may be fired on by snipers or grenaded/fire bombed as they attempt to disperse crowds. Crowds may be manipulated by terrorists to draw troops into ambushes. Propaganda and rumour spreading will be used by the terrorists to discredit the military forces. In the UK in particular, the distorting effects of the mass media will be

⁵³ 'Standardisation on 5.56mm', Draft Reply to Lt. Gen. George Lea's Letter to CDS GH 718/69, 17 April 1969, WO 32/21452 – Advanced Weapons – Concept Group Rifles, 1967.

⁵⁴ US Standardisation on 5.56mm, UK Views, WO 32/21452 – Advanced Weapons – Concept Group Rifles, 1967.

*exploited to the full and claims of brutality and of the use of excessive force will be used to inhibit the actions of the security forces.*⁵⁵

In essence, the paper asserted that the 'changing nature of civil disturbance' *inside* the UK's borders necessitated innovative new tactical and technological approaches to warfighting. This was buttressed by the view that inappropriate US tactics and doctrine had been a major contributor to the Kent State Shootings that year, and that the British Army should take whatever steps were necessary to ensure that such a disaster did not take place in Northern Ireland.⁵⁶

Tactically, the focus of civil power operations had its roots in the idea of minimum force, a prominent concept in British accounts of counterinsurgency and colonial warfare. Simply, this was the principle that force should be used 'to the minimum level possible' in scenarios of population-centric warfare.⁵⁷ Supported by a number of scholars including Thomas Mockaitis and Rod Thornton these views have been subject to considerable revision by more contemporary scholars including David French and Huw Bennett.⁵⁸ However, in the 1970s there can be little doubt that minimising dramatic wounding by avoiding the use of high-powered rifles heavily influenced doctrinal and technical discussions. Indeed in one 1970 working paper on tactical doctrine for Northern Ireland, the phrase 'minimum force' appeared no fewer than five times.⁵⁹

Crucially, there was also awareness at the Royal Small Arms Factory that the Army's equipment needed to fall in line with the tactical principle of minimising casualties. One MOD working paper stated that British equipment was needed that

⁵⁵ Paper by CDI(A) on Future Tactical Doctrine and Equipment Requirements For Operations in Support of Civil Power, 31 July 1970, HO 325/125 - Use of Troops in Aid of the Civil Power – Setting up of a Working Party on Internal Security Tactical Doctrine.

⁵⁶ *Letter from E.D Wright to R. Mark (New Scotland Yard), 'Internal Security Tactical Doctrine Working Party', 10 August 1970, HO 325/125 - Use of Troops in Aid of the Civil Power – Setting up of a Working Party on Internal Security Tactical Doctrine.*

⁵⁷, p. 274

⁵⁸ T. Mockaitis, *British Counterinsurgency, 1919-60* (London: Macmillan, 1990); R. Thornton, "'Minimum Force': A Reply to Huw Bennett," *Small Wars & Insurgencies* 20, no. 1 (2009); D. French, *The British Way in Counter-Insurgency* (Oxford: Oxford University Press, 2011); H. Bennett, "The Other Side of the Coin: Minimum and Exemplary Force in British Army Counterinsurgency in Kenya," *Small Wars & Insurgencies* 18, no. 4 (2009); M. L. R. Smith and D. Martin Jones, *The Political Impossibility of Modern Counterinsurgency - Strategic Problems, Puzzles and Paradoxes* (New York: Columbia University Press, 2015).

⁵⁹ Paper by CDI(A) on Future Tactical Doctrine and Equipment Requirements For Operations in Support of Civil Power, 31 July 1970, HO 325/132 - Use of Troops in Aid of the Civil Power – Setting up of a Working Party on Internal Security Tactical Doctrine.

would allow commanders to 'produce a graduated response and to ensure better protection for troops' while soldiers were 'in the full glare of publicity and detailed press comment and within the bounds of very tight political restrictions'.⁶⁰ Among other requirements, this led to a demand for a 'non-injurious chemical incapacitant' designed for dealing with crowds.⁶¹ It eventually led Enfield to develop the ARWEN 37mm less than-lethal anti-riot weapon that fired baton or tear gas rounds.

The piece of equipment identified as possibly the biggest problem, however, was the most important to any armed force: its service rifle. At this point, the British Army had been using the 7.62mm SLR for nearly twenty years, and in light of the minimum force requirements of 'operations in support of civil power', its range and lethality all came under scrutiny. In 1974, a study was carried out that demonstrated the wounding capability of 7.62mm ammunition on sheep cadavers. This showed that in a variety of scenarios, the wounding potential of the ammunition was judged to be well beyond the military requirement of the British Army.⁶² Uniquely, the 7.62mm round perforated the target having passed through a 3.4mm steel plate at ranges of both 300m and 500m and caused significantly larger exit wounds in lateral-medial strikes at 300m. Further analysis during the 1970s found that 'the SLR lacks the degree of selectivity necessary to ensure that only the person at which it is aimed will be damaged (e.g. the 7.62mm round will pass right through a man a short ranges)' and that 'the ideal is a round with the same accuracy as afforded by the rifle but which does not penetrate nor make a wound of dreadful appearance'.⁶³

Evidence of the rifle's performance in-theatre during this period seems to vindicate these concerns. Chapter 3 of the Saville Report, which recounted the events surrounding the wounding of 28 civil rights protesters on Bloody Sunday in 1972 (exactly the kind of operational scenario described by the tactical working groups two years earlier), listed a number of examples of the 7.62mm's fatal lack

⁶⁰ Ibid.

⁶¹ Ibid.

⁶² WO 189/4984 - An Investigation of Wounds Caused by 7.62, 5.56mm and 4.85mm Ball Ammunition, Lt. Col. R. Scott, Maj. A.W. Horne, August 1974.

⁶³ Paper by CDI(A) on Future Tactical Doctrine and Equipment Requirements For Operations in Support of Civil Power, 31 July 1970, HO 325/125 - Use of Troops in Aid of the Civil Power - Setting up of a Working Party on Internal Security Tactical Doctrine.

of precision. Of the victims, Patrick McDaid and Pius McCarron were injured by flying debris from shots fired, Michael Kelly was shot through a rubble barricade, the same shot both killed William McKinney and wounded Joe Mahon, and another shot killed both Gerard McKinney and Gerald Donaghey.⁶⁴

This pattern of thought undoubtedly guided the shift in British opinion towards smaller calibres during the 1970s. From a point at which the additional range and lethality of 7.62mm was seen as a significant asset, the UK moved to favouring the 4.85mm round. In the media-centred conflict environment of Northern Ireland, a rapid move away from the full-power cartridge was essential. Using a conventional cartridge casing, the British 4.85mm round was less experimental than the West German 4.7mm caseless ammunition. However, the tactical advantages that might be accrued from this lighter type of round might not justify NATO switching over to it. In all, therefore, the British approach to NATO small arms RSI was shaped by a socio-technical backdrop no less intricate than that of the Americans. The increasing involvement of British forces in a 'civil power' operation in Northern Ireland, in particular, shaped priorities on range and lethality away from the US position.

The Evolution of the Socio-Technical Network

While the differences between these sets of socially constructed 'national military requirements' were significant, what created an initial impasse at the NATO trials in 1979-80 was how these requirements enframed the evolution of the small arms RSI debate. In the US, technical preferences had been inextricably linked to military identity from the outset. As NATO trials started, however, the debate over small arms RSI had become increasingly overshadowed by each country's wish not just for standardisation to serve its own doctrinal requirements, but to achieve consensus around a small arms system of its own making. NATO's major powers began to conceive of RSI as a zero-sum game, in which opposition to small arms systems produced by other powers became arguably the most embedded preference of the overarching socio-technical network. Indeed, this was a historic

⁶⁴ *The Guardian*, 'Bloody Sunday Report: Details of the 28 people shot and injured', 15 June 2010 extract from Chapter III of the Saville Report (2010), accessible at <http://www.theguardian.com/uk/2010/jun/15/bloody-sunday-victims-shot-injured>, accessed 16 June 2014.

process that began almost with the formation of the alliance and went far beyond the heterogeneity in national military requirements discussed earlier in this paper. In this socio-technical network, historic animosities relating to prior humiliations and economic imperatives were layered in between these differences in national military requirements and made the achievement of a consensus all but impossible.

While Britain eventually abandoned the EM2 in favour of the 7.62 cartridge in the early 1950s, the indignation in the British small arms community continued to overshadow decision-making on RSI issues for decades. Woodrow Wyatt accused Churchill of 'selling out legitimate British interests in an effort to placate the Americans'⁶⁵ in a Parliamentary debate in 1954. Twenty-two years later (in a discussion of the 1976 MOU), Lord Shinwell continued to bemoan the unjustified decision to discard 'what was regarded as the most efficient rifle to date'.⁶⁶ Edward Ezell wrote in 1984 that the sentiment that filled Woodrow Wyatt's impassioned speech in Parliament 'expressed the fear of many Britons: the loss of national identity', and that 'an essential element of the soldier's *esprit de corps* was the national origin of the weapon'.⁶⁷ Just like the US, where the commitment to larger cartridges had always been linked to 'national, institutional and personal biases', Britain's small arms community was increasingly against the adoption of small arms technology developed overseas.⁶⁸

One important aspect of the network was the national economic imperatives that underpinned all RSI in NATO, whether related to small arms systems or not. While more efficient defence production was frequently cited as a benefit of RSI, the need to serve British, West German and US military requirements also implied commitments to their own industrial small arms communities. The United States, the pre-eminent defence producer in the alliance, saw this a violation of the free enterprise process, but European states consistently asserted that a productive

⁶⁵ Ezell, *The Great Rifle Controversy: Search for the Ultimate Infantry Weapon from World War 2 through Vietnam and Beyond.*, p. 88.

⁶⁶ *Hansard*, HL Deb 29 June 1976, vol. 372, cc663-6, accessible at <http://hansard.millbanksystems.com/lords/1976/jun/29/army-weapons-and-ammunition>, accessed 14 July 2014.

⁶⁷ Ezell, *The Great Rifle Controversy: Search for the Ultimate Infantry Weapon from World War II Through Vietnam and Beyond* (London: Stackpole Books, 1984), p. 87

⁶⁸ *Ibid.*, p. 92.

European armaments industry was a prerequisite 'if we are to mobilise NATO's enormous technological and industrial strength for our common defense'.⁶⁹ There was a substantial degree of institutional jockeying over the 'two-way street'; Carl Damm, a CDU member of the Bundestag, argued in 1978 that NATO should keep five-year balance-of-payments records of who bought what from whom, which could then be evened out over the following five years.⁷⁰

Where the sums of money surrounding small arms were always less than for high-technology materiel, the downsizing or removal of original design and manufacturing capability was often the point of contention. In the UK, for example, one knock-on effect of the decision to adopt the Belgian-designed L1A1 rifle was the move in 1959 to relegate RSAF Enfield (the premier publicly-owned small arms design facility) to what some officers called a 'post-design role'⁷¹. Moreover, lamentation over this change endured in British thinking on small arms RSI; one briefing paper in 1968 stated that 'the present small arms procurement policy has disadvantages which may not have been apparent when original design work at Enfield was stopped'⁷². It argued that it not only meant that the UK could not adopt weapons based on its own national requirements, but also that it could not take advantage of the 'expanding world market in small arms'.⁷³ By 1967, it was clear that Enfield was not 'economically viable'⁷⁴ and was only being kept open in the hope that it would one day return to original research and development. The US, likewise, had long viewed RSI initiatives as a cover for the 'establishment and growth of a vigorous European defence industrial base'⁷⁵. In a publication from 1979, the Center for Strategic and International Studies argued that 'we Americans still see ourselves as the great Arsenal of Democracy. We prefer to go it alone, to

⁶⁹ Transatlantic Policy Panel, 'Allied Interdependence Newsletter', *The Center for Strategic and International Studies*, No. 9 (March 1979), DEFE 13/1167 – Interoperability and Standardisation of Equipment in NATO (1978/1979)

⁷⁰ Briefing to the Minister of State for Defence on the NATO Aviation Week and Space Technology Symposium in Brussels (26-27 June), 18th July 1978, DEFE 13/1167 – Interoperability and Standardisation of Equipment in NATO (1978/1979)

⁷¹ *Brigadier D of Arty, 'Calibre of Future Small Arms', 30th April 1969, WO 32/21452 – Advanced Weapons – Concept Group Rifles, 1967*

⁷² *Paper for ACGS (OR), BR 159 (GS(OR)2), 11th November 1968*

⁷³ Ibid.

⁷⁴ Ford, *Weapon of Choice: Small Arms and the Culture of Military Innovation* (London: Hurst, 2017), p. 118

⁷⁵ Ibid.

meet any challenge, and so forth. We conduct our national defense debate in terms of 'Who is Number One – the Soviet Union, or the United States?'⁷⁶

The picture of the socio-technical network of small arms RSI in the late 1970s was therefore a complicated one. Each of NATO's major defence producers had individual (socio-technical) national military requirements for a new small arms system, but crucially, the network had also become polarised by both the legacies of prior policy decisions and the broader economic context of RSI in NATO. There can be no doubting the strength of the animosity between the US and British arms establishments, in particular; one 1969 report merely presented the British line on the prospect of establishing 5.56mm as the NATO calibre as 'negative... one of opposition', without offering any explanation for that position.⁷⁷ While, as Callon argues, socio-technical networks can serve as arenas for the pursuit of dominant interests or technical perspectives, it is clear that they can also be characterised by (intractable) conflict between different actors, where embedded preferences and prejudices culminate in impasse.

Indeed, in the case of small arms RSI in NATO, such an impasse allowed an entirely different kind of actor, *Fabrique Nationale*, to achieve a degree of consensus around a new cartridge, the SS109. Uniquely in its capacity as a commercial actor, FN was able to propose an ammunition compromise without the baggage of imposing a foreign small arms system on alliance powers. This was not achieved via the formation of an entirely new network, but the achievement of a new compromise within the old one. In 1979, when all three of the NATO big powers proposed their own ammunition and weapon for trials in Hammelburg, West Germany, *Fabrique Nationale's* main small arms objective was to find a way to sell the FN Minimi to the US Army. A light machine gun, however, was not a requirement for the West Germans, who remained committed to heavier sustained fire belt-fed weapons like the 7.62mm MG3. Unlike the British Armed Forces, furthermore, the Bundeswehr's rifle was serviceable for 'at least another

⁷⁶ Transatlantic Policy Panel, 'Allied Interdependence Newsletter', *The Center for Strategic and International Studies*, No. 9 (March 1979), DEFE 13/1167 – Interoperability and Standardisation of Equipment in NATO (1978/1979)

⁷⁷ A/59/Small Arms/190 (GS(OR) 2, 'Future Small Arms Study', 12 April 1969, WO 32/21452 – Advanced Weapons – Concept Group Rifles, 1967.

ten years'⁷⁸; consequently, the West Germans were willing to allow other NATO powers to use 5.56mm ammunition but were unwilling to adopt it themselves given their ambitions for the G11. Thus, FN ultimately produced a cartridge that was simultaneously able to negotiate each actor's long-held prejudices. It could buy the support of those European powers that wanted a two-way street in R&D, manufacturing and procurement, while both the US and UK were able to use the SS109 in their own small arms systems.

Ultimately, FN took advantage of the different challenges facing the big three powers to redefine the problem in less ambitious terms but in ways that all the powers could accept. West Germany accepted 5.56mm as a standard but refused to adopt the ammunition for service. Britain on the other hand dropped its own round in favour of 5.56mm ammunition even though on the face of it, it was considered to be highly lethal and unsuitable for operations in Northern Ireland. The Americans found themselves having to select FN's version of 5.56mm ammunition so as to avoid the embarrassment of using a standard that no other NATO power would accept. All three powers ended up selecting something that they would not have initially chosen but which was nonetheless acceptable to the Alliance as a whole.

Conclusion

Compared to those literatures that draw on IR theory or political economy, this article has taken an approach that analyses the way that technology change is emblematic of the cultural processes from which they emerge. By drawing on Actor Network Theory it becomes evident that the relationship between technology and its developers is mutually constitutive. Referring to technology and the groups that push it forward as equal 'social actants', the arguments advanced here reflect Bruno Latour's assertion that technology reinforces and demonstrates identity.⁷⁹ During the Cold War, technological choices reflected

⁷⁸ Ezell, *The Great Rifle Controversy: Search for the Ultimate Infantry Weapon from World War 2 through Vietnam and Beyond*, p. 278.

⁷⁹ B. Latour, "Social Theory and the Study of Computerised Work Sites," in *Information Technology and Changes in Organisational Work*, ed. W. J. Orlikowski, et al. (London: Chapman and Hall, 1996), p. 301; T. J. Pinch and W. E. Bijker, "The Social Construction of Facts and Artefacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other," *Social Studies of Science* 14, no. 3 (1984).

embedded socio-technical preferences on range and lethality that were as much about evolving relational structures surrounding identity and status as they were related to nations' individual utility calculations.

Thus, the Americans were worried about replacing the M16 with a European weapon because it would suggest that the decision to get rid of the M-14 was misplaced. The British remained hamstrung by being forced to abandon their EM2 weapon and adopt American standards. Of the three it was the West Germans who most clearly focused on the utility benefits that might come from switching to the G11. Nevertheless, the net result was that all three states were very reluctant to adopt weapons designed and built overseas and had to find ways to justify choices that balanced identity against Alliance effectiveness. Consequently, the main priority of the FRG was developing a rifle that would give infantry a flexible mechanised capability in a conventional war against the Soviet Union. By contrast British thinking was far more conditioned by the knock-on effect from the adoption of the SLR and the intensifying conflict in Northern Ireland. The Americans, meanwhile, still held on to the lethality myth they had constructed in order to justify the replacement of the M-14 in favour of the M16. FN's success lay in the recognition that NATO's ambition for standardisation had consistently failed when framed in terms of grand strategy. As a commercial actor providing something of a compromise, FN was able to duck the deeper political challenges associated with standardisation.

This case study thus reveals the extent to which national defence priorities deviated from those of NATO during the Cold War. Although the NATO-USSR divide dominated foreign policy discourse in this period, the debates surrounding small arms standardisation make it clear that there was far more going on in the minds of NATO member states than bipolarity-centred historical accounts would have us believe. Only the FRG's strategic agenda was synonymous with that of the collective; the attitudes of the British and Americans to defence matters were clearly conditioned by their participation in other conflicts, their national biases, and even their economic interests. In this way, the sociology of small arms development may be indicative of the incoherence and volatility of collective strategic thinking generally, and of the vast networks of countervailing interests on which it is based.