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Introduction: British nuclear culture

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Abstract. In the extended introduction to this special issue on British nuclear culture, the guest editors outline the main historiographical and conceptual contours of British nuclear scholarship, and explore whether we can begin to define 'British nuclear culture' before introducing the contributors to this special issue, whose work we have organized into three broad areas. The first part is devoted to three articles that offer explicit and extended attempts to reconceptualize British nuclear culture, illuminating the complex links between nuclear science, the state and the individual citizen. The second part of this issue is devoted to three articles that concentrate on aspects of the history of nuclear science – focusing particularly on intellectuals, nuclear scientists and enthusiasts – alongside analysis of the popularization of nuclear science as well as the relationship between the state and nuclear science and its practitioners. In the third part, four articles examine the diverse ways in which 'official' narratives of the atomic age can be questioned, disrupted or enhanced by analysing the significance of journalistic, anti-nuclear and fictional narratives to the development of nuclear culture in Britain.

In the last decade or so, humanities-based nuclear scholarship has expanded and diversified significantly, and there has been steady refinement of the conceptual and methodological frameworks used in the field. This applies to British nuclear scholarship too. To help explain this trend in the British context, we can look to the increased interest in cultural studies of the Cold War era, the continued release of official documentation under the Freedom of Information Act (2005), the emergence of new and varied source materials, the expansion of research possibilities opened up by digital archiving, and the influence of the imaginative and ambitious insights of nuclear scholars worldwide. Most recently, the aftermath of the triple meltdown at the Fukushima Daiichi nuclear power plant in Japan in March 2011 saw the re-emergence of global nuclear 'motifs' such as that of Ulrich Beck's 'risk society'.[1] Aligned with continuing uncertainty over nuclear proliferation, this special issue on British nuclear culture seems especially timely in a period when nuclear debates are being revisited.

But what precisely is 'British nuclear culture'? This question lies at the heart of this special issue, which brings together specialists from various fields, including the history of science and technology, cultural and social history, political and diplomatic history,

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1 Ulrich Beck, *Risk Society: Towards a New Modernity*, trans. Mark Ritter, London: Sage, 1992; Jacob Darwin Hamblin, 'Fukushima and the motifs of nuclear history', *Environmental History* (2012) 17, pp. 285–299. Throughout this special issue contributors may use the terms 'atomic' and 'nuclear' interchangeably, and the same applies to this introduction.

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cultural studies, gender studies, comparative and transnational history and literary and film studies, to explore how we can identify and conceptualize 'British nuclear culture' across broad and interdisciplinary areas of research. This issue, which emerged out of an international conference entitled British Nuclear Culture: Themes, Approaches and Perspectives held at the University of Liverpool in June 2010, aims to encourage further investigation of 'British nuclear culture'. Given that scholars of British nuclear culture have so far been heavily influenced by the comparatively mature historiography on American atomic culture, this special issue aims to foreground some of the specifically British experiences of the nuclear age.

Writing British nuclear history

Work on British nuclear scientists and their scientific communities in the early years of the twentieth century is a well-trodden area of scholarly research. Also, this early period of nuclear culture has been well served by biographical approaches to prominent nuclear scientists, the notable figures being Ernest Rutherford, Frederick Soddy, John Cockcroft and James Chadwick.[2] Alongside explorations of medical and industrial applications of atomic technology, by 1940 the international scientific community had acknowledged the possibility of a workable atomic bomb with increasing certainty. Historians have focused on the ways in which British-based nuclear scientists communicated their concerns and discoveries to relevant government departments after the outbreak of war with Germany. Perhaps most significantly, the 'Frisch–Peierls Memorandum' of 1940 provided the impetus for the establishment of the MAUD (Military Application of Uranium Detonation) Committee, which in turn eventually helped persuade the American government to commit to the Manhattan Project.[3] Recent monographs by Andrew Brown on Joseph Rotblat, and by Christoph Laucht on German-speaking émigré scientists, have offered fuller examinations of the input of émigré scientists into the British and Allied wartime atomic weapons programmes. This work extends our understanding of the role of émigré scientists in the formation of national and transnational scientist movements which were created to voice the social concerns of nuclear scientists after Hiroshima and Nagasaki.[4]

2 The literature is extensive here. See Michael I. Freedman, 'Frederick Soddy and the practical significance of radioactive matter', *BJHS* (1979) 12, pp. 257–260; Richard E. Sclove, 'From alchemy to atomic war: Frederick Soddy's "technology assessment" of atomic energy, 1900–1915', *Science, Technology and Human Values* (1989) 14, pp. 163–194; Edward Shire, *Rutherford and the Nuclear Atom*, Harlow: Longman, 1972; Thaddeus J. Trenn, *The Self-Splitting Atom: The History of the Rutherford–Soddy Collaboration*, London: Taylor and Francis, 1977; Thaddeus Trenn, 'The central role of energy in Soddy's holistic and critical approach to nuclear science, economics, and social responsibility', *BJHS* (1979) 12, pp. 261–276; Margaret Gowing, 'James Chadwick and the atomic bomb', *Notes and Records of the Royal Society of London* (1993) 47, pp. 79–92; Andrew Brown, *The Neutron and the Bomb: A Biography of Sir James Chadwick*, Oxford: Oxford University Press, 1997; Guy Hartcup and T.E. Allibone, *Cockcroft and the Atom*, Bristol: A. Hilger, 1984.

3 Lorna Arnold, 'The history of nuclear weapons: the Frisch–Peierls memorandum on the possible construction of atomic bombs of February 1940', *Cold War History* (2003) 3, pp. 111–126.

4 Andrew Brown, *Keeper of the Nuclear Conscience: The Life and Work of Joseph Rotblat*, Oxford: Oxford University Press, 2012; Christoph Laucht, *Elemental Germans: Klaus Fuchs, Rudolf Peierls and the Making of*

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In his attempt to describe the links between atomic science, scientists and 'the public' in the early twentieth century, Kirk Willis coined the term 'British nuclear culture'.[5] This pre-Manhattan Project period saw a flurry of nuclear-inspired activity across all levels of British society, including an increase of nuclear reportage in the national press and the emergence of a nuclear-themed popular culture. When Britain, the United States and Canada declared the 'atomic age' and confronted their populations with the new weapon in the immediate aftermath of Hiroshima,[6] theological, artistic and intellectual communities debated the atom bomb alongside the formal organization of the nuclear scientists into political and educational groups.[7] Nuclear scholarship on this period has predominantly concentrated on elite groups of government officials and scientists.

In many ways, this is understandable. In the months following August 1945, the British government had significant atomic policy decisions to make and these decisions shaped and defined Britain's Cold War role. The meeting of the Cabinet Committee on Atomic Energy on 25 October 1946 neatly illustrates some key features of how British nuclear policy developed, culminating in one of the better-known statements of post-war nuclear intent. The committee met to discuss the feasibility of an independent British nuclear programme and, when faced with the tremendous cost of constructing a gaseous diffusion plant for uranium enrichment, both the Chancellor of the Exchequer Hugh Dalton and the President of the Board of Trade Stafford Cripps questioned the existence

British Nuclear Culture 1939–59, Basingstoke: Palgrave Macmillan, 2012. See also Lorna Arnold, with Katherine Pyne, *Britain and the H-Bomb*, Basingstoke: Palgrave Macmillan, 2001; Frank Barnaby and Douglas Holdstock (eds.), *The British Nuclear Weapons Programme*, London: Cass, 2003; Brian Cathcart, *Test of Greatness: Britain's Struggle for the Atom Bomb*, London: Murray, 1994; Ronald W. Clark, *The Birth of the Bomb: The Untold Story of Britain's Part in the Weapon That Changed the World*, London: Phoenix House, 1961; Margaret Gowing, *Britain and Atomic Energy, 1939–1945*, London: Macmillan, 1964; Lillian Hoddeson *et al.*, *Critical Assembly*, Cambridge: Cambridge University Press, 1993; Néstor Herran, 'Spreading nucleonics: the Isotope School at the Atomic Energy Research Establishment, 1951–67', *BJHS* (2006) 39, pp. 569–586; Christoph Laucht, '"Los Alamos in a way was a city of foreigners": German-speaking émigré scientists and the making of the atom bomb at Los Alamos, New Mexico, 1943–1946', *New Mexico Historical Review* (2011) 86, pp. 223–250; Graham Spinardi, 'Aldermaston and British nuclear weapons development: "testing the Zuckerman Thesis"', *Social Studies of Science* (1997) 27, pp. 547–582; Ferenc M. Szasz, *British Scientists and the Manhattan Project: The Los Alamos Years*, New York: St Martin's Press, 1992; Ian Welsh, 'The NIMBY syndrome: its significance in the history of the nuclear debate in Britain', *BJHS* (1993) 26, pp. 15–32; Sabine Lee, '"In no sense vital and actually not even important"? Reality and perception of Britain's contribution to the development of nuclear weapons', *Contemporary British History* (2006) 20, pp. 159–185; Greta Jones, 'The mushroom-shaped cloud: British scientists' opposition to nuclear weapons policy, 1945–57', *Annals of Science* (1986) 43, pp. 1–26. On Americanization see John Krige, *American Hegemony and the Postwar Reconstruction of Science in Europe*, Cambridge, MA: MIT Press, 2006; Christoph Laucht, '"An extraordinary achievement of the 'American Way':" Hollywood and the Americanization of the making of the atom bomb in *Fat Man and Little Boy*', *European Journal of American Culture* (2009) 28, pp. 41–56.

5 Kirk Willis, 'The origins of British nuclear culture, 1895–1939', *Journal of British Studies* (1995) 34, pp. 59–89.

6 Peter N. Kirstein, 'Hiroshima and spinning the atom: America, Britain, and Canada proclaim the Nuclear Age, 6 August 1945', *The Historian* (2009) 71, pp. 805–827.

7 Michael Hughes, *Conscience and Conflict: Methodism, Peace and War in the Twentieth Century*, Peterborough: Epworth, 2008, pp. 140–179; Dianne Kirby, 'The Church of England and the Cold War nuclear debate', *Twentieth Century British History* (1993) 4, pp. 250–83; Kirk Willis, '"God and the atom": British churchmen and the challenge of nuclear power 1945', *Albion: A Quarterly Journal Concerned with British Studies* (1997) 29, pp. 422–457.

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of any rationale behind an independent British nuclear deterrent. Ernest Bevin reportedly interjected,

> that won't do at all, we've got to have this . . . I don't mind for myself, but I don't want any other Foreign Secretary of this country to be talked to or at by a Secretary of State in the United States as I have just had . . . We've got to have this thing over here whatever it costs . . . We've got to have the bloody Union Jack on top of it.

As Peter Hennessy put it, 'Bevin saved Britain's Bomb.'[8]

Read against the background of the immediate cancellation of Anglo-American wartime nuclear cooperation after the United States Congress had passed the McMahon Act in 1946, this statement represents a historically specific type of desperation. While the close nuclear collaboration between Britain, the United States and Canada had led to the development of the first atomic bombs in the Manhattan Project, the Attlee government now found itself excluded from access to vital nuclear information.[9] Alongside the disintegration of the British Empire, the emergence of the United States and the Soviet Union as dominant superpowers in the years following 1945 intensified Britain's loss of influence in world affairs. Historian Margaret Gowing argued that the Attlee government's decision to pursue its independent nuclear arms programme was irrational and emotionally motivated to make up for the country's decreasing world role.[10] Hennessy's assessment of Bevin's personal achievement in getting an independent British atomic arms programme under way is indicative of a strong preoccupation with high politics and elite personalities in the existing historiography on British nuclear history. Such approaches risk overprivileging nuclear 'moments' in the grand atomic narrative, as if Bevin's interjection was the key factor in getting the post-war British atomic weapons project under way.

Most notably, the official historians commissioned by the United Kingdom Atomic Energy Authority (UKAEA), Margaret Gowing and latterly Lorna Arnold, have influenced much of the work on Britain in the atomic age.[11] The institutional and official tone set by a small number of scholars has led to a significant proportion of atomic history being focused predominantly on government and elites. It is no coincidence that arguably the most developed historiography is on Cold War nuclear weapons policy[12]

8 Peter Hennessy, 'Revealed, 30 years after our first nuclear explosion . . . How Bevin saved Britain's Bomb', *The Times*, 30 September 1982, p. 10.

9 Simon Ball, 'Military nuclear relations between the United States and Great Britain under the terms of the McMahon Act, 1946–1958', *Historical Journal* (1995) 38, pp. 439–454.

10 Margaret Gowing, assisted by Lorna Arnold, *Independence and Deterrence: Britain and Atomic Energy, 1945–1952*, London: Macmillan, 1974, p. 184.

11 Margaret Gowing, *Britain and Atomic Energy 1939–1945*, London: Macmillan, 1964; Gowing, op. cit. (10); Arnold and Pyne, op. cit. (4); Lorna Arnold, *Windscale 1957: Anatomy of a Nuclear Accident*, 2nd edn, Basingstoke: Palgrave Macmillan, 1995; Lorna Arnold and Mark Smith, *Britain, Australia and the Bomb: The Nuclear Tests and Their Aftermath*, 2nd edn, Basingstoke: Palgrave Macmillan, 2006.

12 See Peter Hennessy (ed.), *Cabinets and the Bomb*, Oxford: Oxford University Press, 2007; John Baylis and A. MacMillan, 'The British global strategy paper of 1952', *Journal of Strategic Studies* (1993) 16, pp. 200–226; Ian Clark, *Nuclear Diplomacy and the Special Relationship: Britain's Deterrent and America, 1957–1962*, Oxford: Clarendon, 1994; Stuart Croft, 'Continuity and change in British thinking about nuclear weapons', *Political Studies* (1994) 42, pp. 228–242; David Edgerton, *Warfare State: Britain,*

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and Anglo-American nuclear relations.[13] Other areas of British nuclear history that have attracted attention include analyses of military strategy and delivery systems,[14] as well as work on espionage and intelligence networks in the Cold War era.[15] In addition, there are well-established works on the infrastructure of the British nuclear state,[16] including examinations of the economic and regional aspects of the British nuclear weapons

1920–1970, Cambridge: Cambridge University Press, 2006; Leon D. Epstein, 'The Nuclear deterrent and the British election of 1964', *Journal of British Studies* (1966) 5, pp. 139–163; Lawrence Freedman, *Britain and Nuclear Weapons*, London: Macmillan, 1980; Matthew Grant (ed.), *The British Way in Cold Warfare*, London: Continuum, 2008; Richard Maguire, 'Scientific dissent amid the United Kingdom government's nuclear weapons programme', *History Workshop Journal* (2007) 63, pp. 113–135; Martin Navias, *Nuclear Weapons and British Strategic Planning, 1955–1958*, Oxford: Clarendon, 1991; Robert O'Neill, 'Britain and the future of nuclear weapons', *International Affairs* (1995) 71, pp. 747–761; David Reynolds, *Britannia Overruled: British Policy and World Power in the 20th Century*, London: Longman, 1991.

13 For recent work published on the British nuclear weapons programme as part of an AHRC-funded project based in the Mountbatten Centre for International Studies, Southampton, see John R. Walker, *British Nuclear Weapons and the Test Ban, 1954–1973: Britain, the United States, Weapons Policies and Nuclear Testing: Tensions and Contradictions*, Farnham: Ashgate, 2010; Richard Moore, *Nuclear Illusion, Nuclear Reality: Britain, the United States and Nuclear Weapons, 1958–1964*, Basingstoke: Palgrave Macmillan, 2012; Kristan Stoddart, *Losing an Empire and Finding a Role: Britain, the USA, NATO and Nuclear Weapons, 1964–70*, Basingstoke: Palgrave Macmillan, 2012. See also John Baylis, *Anglo-American Defence Relations 1939–1984: The Special Relationship*, 2nd edn, London: Macmillan, 1984; Baylis, *Ambiguity and Deterrence: British Nuclear Strategy, 1945–1964*, Oxford: Clarendon, 1994; Dimitris Bourantonis and Edward Johnson, 'Anglo-American diplomacy and the introduction of the atomic energy issue in the United Nations: discord and cooperation in 1945', *Contemporary British History* (2004) 18, pp. 1–21; Michael S. Goodman, *Spying on the Nuclear Bear: Anglo-American Intelligence and the Soviet Bomb*, Stanford: Stanford University Press, 2007; Matthew Jones, 'Great Britain, the United States, and consultation over use of the atomic bomb, 1950–1954', *Historical Journal* (2011) 54, pp. 797–828; Saul Kelly, 'No ordinary Foreign Office official: Sir Roger Makins and Anglo-American atomic relations, 1945–55', *Contemporary British History* (2000) 14, pp. 107–124; Septimus H. Paul, *Nuclear Rivals: Anglo-American Atomic Relations, 1941–1952*, Columbus: Ohio State University Press, 2000; Susanna Schrafstetter, '"Loquacious . . . and pointless as ever?" Britain, the United States and the United Nations negotiations on international control of nuclear energy 1945–48', *Contemporary British History* (2002) 16, pp. 87–108; John Simpson, *The Independent Nuclear State: The United States, Britain and the Military Atom*, London: Macmillan, 1983; Stephen Twigge and Len Scott, *Planning Armageddon: Britain, the United States and the Command of Western Nuclear Forces, 1945–1964*, Amsterdam: Harwood Academic, 2000; Jenifer Mackby and Paul Cornish, *US–UK Nuclear Cooperation After 50 Years*, Washington, DC: Center for Strategic and International Studies Press, 2008; Andrew Priest, 'In American hands: Britain, the United States and the Polaris nuclear project, 1962–1968', *Contemporary British History* (2005) 19, pp. 353–376.

14 Simon Ball, 'Harold Macmillan and the politics of defence: the market for strategic ideas during the Sandys era revisited', *Twentieth Century British History* (1995) 6, pp. 78–100; Richard Moore, *The Royal Navy and Nuclear Weapons*, London: Cass, 2001; Priest, op. cit. (13); Michael Quinlan, *Thinking about Nuclear Weapons: Principles, Problems, Prospects*, Oxford: Oxford University Press, 2009; Duncan Redford, 'The "hallmark of a first-class navy": the nuclear-powered submarine in the Royal Navy 1960–77', *Contemporary British History* (2009) 23, pp. 181–197.

15 Richard J. Aldrich, *The Hidden Hand: Britain, America and Cold War Secret Intelligence*, London: Murray, 2001; Goodman, op. cit. (13); Goodman, 'The grandfather of the hydrogen bomb? Anglo-American intelligence and Klaus Fuchs', *Historical Studies in the Physical and Biological Sciences* (2003) 34, pp. 1–22; Goodman, 'Who is trying to keep what secret from whom and why?', *Journal of Cold War Studies* (2005) 7, pp. 124–146.

16 Wayne D. Cocroft and Roger J.C. Thomas, *Cold War: Building for Nuclear Confrontation 1946–1989*, Swindon: English Heritage, 2003; Grant, op. cit. (12); Peter Hennessy, *The Secret State: Preparing for the Worst 1945–2010*, 2nd edn, London: Penguin, 2010.

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programme.[17] Recent work has looked at the role of nuclear engineers,[18] and at how atomic science has been exhibited.[19] Naturally, British government policies and political cultures have defined and shaped the trajectory of nuclear history, but there are other stories to tell. The present issue intends to offer a shift away from top-down histories, offering instead a broader range of voices and approaches.

In recent years, studies on civil defence,[20] nuclear-themed popular culture[21] and design in the nuclear age[22] have become increasingly developed in the historiography. Additionally, important research has been done on the impact of nuclear technology on culture and society more broadly.[23] Research on European atomic diplomacy[24] has been complimented by an increase in studies that treat aspects of British nuclear culture within a comparative or transnational framework to showcase how major international developments or movements played out on a national level.[25] British atomic testing in

17 Brian P. Jamieson, 'Britain's national deterrent: Scotland's answer to the cycle of unemployment?', *Contemporary British History* (2007) 21, pp. 449–469.

18 Sean F. Johnston, *The Neutron's Children: Nuclear Engineers and the Shaping of Identity*, Oxford: Oxford University Press, 2012. Jon Agar, 'Sacrificial Experts? Science, senescence and saving the British nuclear project', *History of Science* (forthcoming), examines scientists and engineers as volunteers after Chernobyl.

19 Sophie Forgan, 'Atoms in wonderland', *History and Technology* (2003) 19, pp. 177–196.

20 Duncan Campbell, *War Plan UK: The Truth about Civil Defence in Britain*, London: Burnett, 1982; Matthew Grant, 'Home defence and the Sandys White Paper, 1957', *Journal of Strategic Studies* (2008) 31, pp. 925–949; Matthew Grant, *After the Bomb: Civil Defence and Nuclear War in Cold War Britain, 1945–68*, Basingstoke: Palgrave Macmillan, 2010; Grant, '"Civil defence gives meaning to your leisure": citizenship, participation, and cultural change in Cold War recruitment propaganda, 1949–54', *Twentieth Century British History* (2010) 22, pp. 52–78; Jeff Hughes, 'The Strath Report: Britain confronts the H-bomb, 1954–1955', *History and Technology* (2003) 19, pp. 257–275; Melissa Smith, 'Architects of Armageddon: the Home Office Scientific Advisers' Branch and civil defence in Britain, 1945–68', *BJHS* (2010) 43, pp. 149–180; Smith, '"What to do if it happens": planners, pamphlets and propaganda in the age of the H-bomb', *Endeavour* (2009) 33, pp. 60–64.

21 Charles A. Carpenter, *Dramatists and the Bomb: American and British Playwrights Confront the Nuclear Age, 1945–1964*, London: Greenwood Press, 1999; James Chapman, 'The BBC and the censorship of *The War Game* (1965)', *Journal of Contemporary History* (2006) 41, pp. 75–94; Chapman, '*The War Game* controversy – again', *Journal of Contemporary History* (2008) 43, pp. 105–112; Roger Luckhurst, *Science Fiction*, Cambridge: Polity, 2005; Tony Shaw, *British Cinema and the Cold War: The State, Propaganda and Consensus*, London: I.B. Tauris, 2001; Tony Shaw, 'The BBC, the state and Cold War culture: the case of television's *The War Game* (1965)', *English Historical Review* (2006) 121, pp. 351–384; Mike Wayne, 'Failing the public: the BBC, *The War Game* and revisionist history, a reply to James Chapman', *Journal of Contemporary History* (2007) 42, pp. 627–637; David Seed, 'TV docudrama and the nuclear subject: *The War Game*, *The Day After* and *Threads*', in John R. Cook and Peter Wright (eds.), *British Science Fiction Television: A Hitchhiker's Guide*, London: I.B. Tauris, 2006, pp. 154–173.

22 Richard Hornsey, '"Everything is made of atoms": the reprogramming of space and time in post-war London', *Journal of Historical Geography* (2008) 34, pp. 94–117.

23 Ian Welsh, *Mobilising Modernity: The Nuclear Moment*, London: Routledge, 2003.

24 David James Gill, 'Ministers, markets and missiles: the British government, the European Economic Community and the Nuclear Non-proliferation Treaty, 1964–68', *Diplomacy and Statecraft* (2010) 21, pp. 451–470; Helen Parr, 'Transformation and tradition: Anglo-French nuclear cooperation and Britain's policy towards the European Community', in Grant, op. cit. (12), pp. 87–103.

25 See Tracy Davies, *Stages of Emergency: Cold War Nuclear Civil Defense*, Durham, NC: Duke University Press, 2007; Holger Nehring, 'National internationalists: British and West German protests against nuclear weapons, the politics of transnational communications and the social history of the Cold War, 1957–1964',

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Australia and New Zealand, and especially the Republic of Kiribati (formerly a part of the crown colony of Gilbert and Ellice Islands), forms the subject of transnational and environmental histories that are not yet complete.[26] More work needs to be done to collect oral histories of the nuclear past similar to the recent Sellafield Stories oral history project or edited reminiscences of veterans who participated in the British H-bomb tests at Christmas Island.[27]

Away from British nuclear history, a variety of conceptual frameworks have been developed in an attempt to understand the links between nuclear science and political culture. Some scholars suggest that both military and civilian applications of atomic energy can embody 'sociotechnical imaginaries'. Defined by Sheila Jasanoff and Sang-Hyun Kim as 'collectively imagined forms of social life and social order reflected in the design and fulfilment of nation-specific scientific and/or technological projects', these imaginaries may 'describe attainable futures and prescribe futures that states believe ought to be attained'.[28] With this in mind, to what extent was British nuclear policy driven by a belief in the efficacy and necessity of pursuing nuclear development in order to achieve a policy of deterrence, and to encourage domestic prosperity? Did peaceful and military applications of atomic power assume a pivotal role in Whitehall's attempts to shape ideas of 'Britishness' in the post-war era?[29] It can be argued that the 2006 and 2008 White Papers on the renewal of Britain's nuclear deterrent and the construction of new nuclear power stations demonstrate the extent to which these 'sociotechnical imaginaries' are embedded in official government discourse up to the present day.[30]

Elsewhere, as part of her work on post-war France, Gabrielle Hecht introduced the term 'technopolitics' – which refers to 'the strategic practice of designing or using technology to constitute, embody, or enact political goals' – as part of her analysis of civilian nuclear energy and the formation of national identity.[31] Along these lines, the result of British 'technopolitics' was an ambitious nuclear weapons project that led Britain to become the world's third atomic and thermonuclear power in 1952 and 1957

Contemporary European History (2005) 14, pp. 559–582; Mark B. Smith, 'Peaceful coexistence at all costs: Cold War exchanges between Britain and the Soviet Union in 1956', *Cold War History* (forthcoming).

26 John Crawford, '"A political H-bomb": New Zealand and the British thermonuclear weapon test of 1957–58', *Journal of Imperial and Commonwealth History* (1998) 26, pp. 127–150; Roger Cross, 'British nuclear tests and the indigenous people of Australia', in Douglas Holdstock and Frank Barnaby (eds.), *The British Nuclear Weapons Programme 1952–2002*, London: Cass, 2003, pp. 76–90; Joan Smith, *Clouds of Deceit: The Deadly Legacy of Britain's Bomb Tests*, London: Faber, 1985; Arnold and Smith, op. cit. (11).

27 See www.sellafieldstories.org.uk; Hunter Davies (ed.), *Sellafield Stories: Life with Britain's First Nuclear Plant*, London: Constable, 2012; Derek Robinson, *Just Testing*, London: Collins Harvill, 1985.

28 Sheila Jasanoff and Sang-Hyun Kim, 'Containing the atom: sociotechnical imaginaries and nuclear power in the United States and South Korea', *Minerva* (2009) 47, pp. 119–146, 120.

29 For critical analyses of the concept of 'Britishness' see Linda Colley, *Britons: Forging the Nation 1707–1837*, new edn, London: Pimlico, 2003; Jeffrey Richards, *Films and British National Identity: From Dickens to 'Dad's Army'*, Manchester: Manchester University Press, 1997; Sonya O. Rose, *Which People's War? National Identity and Citizenship in Wartime Britain 1939–1945*, Oxford: Oxford University Press, 2003.

30 'The future of the United Kingdom's nuclear deterrent', Cm. 6994, London: HMSO, 2006; 'Meeting the energy challenge: a White Paper on Nuclear Energy, January 2008', Cm. 7296 , London: HMSO, 2008.

31 Gabrielle Hecht, *The Radiance of France: Nuclear Power and National Identity after World War II*, Cambridge, MA: MIT Press, 1998, p. 15.

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respectively.[32] In addition, Britain also became a leader in civilian nuclear power through the establishment of the UKAEA in 1955. In October 1956, around two years after the Soviet Union had opened its Obninsk reactor, the Calder Hall reactors started to produce electricity for the national grid.[33]

Conceptualizing British nuclear culture

So, with this variety and breadth of nuclear scholarship, how has 'nuclear culture' been conceptualized? Existing conceptualizations of 'nuclear culture' are varied, and many have emerged from scholarship that has attempted to trace the social, cultural and political impact of nuclear technology in the American context. Perhaps most notably, Paul Boyer's *By the Bomb's Early Light* (1985) offered an intricate history of American society in the early atomic age, and the text still offers an exemplary model of how to trace the powerful impact nuclear technology can have on human society.[34] Since the publication of this crucial book, the historiography on American atomic culture has matured at a faster rate than in any other national context.[35] Boyer coined the phrase 'nuclear consciousness', arguing that 'the Bomb has become one of those categories of Being, like Space and Time, that, according to Kant, are built into the very structure of our minds, giving shape and meaning to all our perceptions'.[36] Similarly, Peter Hales describes the 'changed imagination of infinitude' that emerged with the advent of the atomic mushroom cloud.[37]

For these authors, to understand the impact of atomic culture is to understand profound psychological, spiritual and social change. They argue that the atomic bomb has far-reaching consequences on the lives of individual citizens, and a significant impact on national culture. Shortly after Hiroshima, the American journalist and nuclear disarmament activist Norman Cousins argued that the atom bomb touched upon

32 Gowing, op. cit. (10), *passim*.

33 Arnold, op. cit. (11), pp. xxi–xxii; Central Office of Information, *Nuclear Energy in Britain*, 2nd edn, London: HMSO, 1960, 9, pp. 11–13; Paul Josephson, *Red Atom: Russia's Nuclear Power Program from Stalin to Today*, Pittsburgh: University of Pittsburgh Press, 2000, p. 2.

34 Paul S. Boyer, *By the Bomb's Early Light: American Thought and Culture at the Dawn of the Atomic Age*, New York: Pantheon, 1985, repr. Chapel Hill: University of North Carolina Press, 1994.

35 See, for example, Spencer R. Weart, *Nuclear Fear: A History of Images*, Cambridge, MA: Harvard University Press, 1988; revised version repr. as *The Rise of Nuclear Fear*, Cambridge, MA: Harvard University Press, 2012; Allan M. Winkler, *Life under a Cloud: American Anxiety about the Atom*, New York: Oxford University Press, 1993, repr. Urbana: University of Illinois Press, 1999; Margot A. Henriksen, *Dr. Strangelove's America: Society and Culture in the Atomic Age*, Berkeley: University of California Press, 1997; Scott C. Zeman and Michael A. Amundson, eds., *Atomic Culture: How We Learned to Stop Worrying and Love the Bomb*, Boulder: University Press of Colorado, 2004; Rosemary B. Mariner and G. Kurt Piehler (eds.), *The Atomic Bomb and American Society: New Perspectives*, Knoxville: University of Tennessee Press, 2009; and Robert A. Jacobs, *The Dragon's Tail: Americans Face the Atomic Age*, Amherst: University of Massachusetts Press, 2010.

36 Boyer, op. cit. (34), pp. xix–xx.

37 Peter B. Hales, 'The atomic sublime', *American Studies* (1991) 32, pp. 5–31, 28. See also Peggy Rosenthal, 'The nuclear mushroom cloud as cultural image', *American Literary History* (1991) 3, pp. 63–92.

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virtually all aspects of the human experience.[38] Similarly, the American avant-garde artist and theorist Maya Deren wrote in 1946 that 'man the scientist has, through the exercise of rational faculties, become more competent than the modern artist. That which the surrealists labor and sweat to achieve, and end by only simulating, can be accomplished in full reality, by the atom bomb'.[39]

Some 'nuclear culture' definitions are restricted in their focus because of the chosen methodological approach. John Canaday, for example, attempted to examine 'atomic culture' by 'applying the tools and techniques of literary criticism to uncover the uses of literature in the development and deployment of nuclear weapons and the physics on which they most overtly depend'.[40] Michael Messmer defined 'nuclear culture' as the 'pervasive cultural embeddedness of the bomb', similarly ignoring peaceful applications of atomic power.[41] Scott Zeman and Michael Amundson's approach to 'American atomic culture' is one which covers 'all types of atomic texts including the traditional "highbrow" (elite) and "lowbrow" (popular) cultural expressions', thus explicitly incorporating popular culture and arguing against a hierarchical culture definition that privileges high culture and politics.[42] In his examination of the origins of early British nuclear culture, Kirk Willis defined 'British nuclear culture' as 'the knowledge, imagery, and artefacts of applied nuclear physics'.[43] More recently, Christoph Laucht has proposed a broader definition of 'British nuclear culture' as 'the sum of all experiences with regard to civilian and military uses of atomic energy, including such diverse layers as science and technology (both theoretical and applied), society, culture, politics, identity, gender, race, ethnicity and class', arguing that this definition helps to open up a wider research agenda.[44] A study by Holger Nehring based on British and West German protests against nuclear weapons during the late 1950s and early 1960s introduced the notion of 'the cultures of the Cold War', arguing that the conflict 'was also a "civil war" fought within domestic societies'.[45]

It does appear, then, that consensus is lacking over how to define 'nuclear culture'. Taken as a whole, the contributions that encompass this special issue reflect the eclectic nature of approaches to the nuclear past. It is interesting that most contributors in this issue are reluctant to offer a monolithic definition of British nuclear culture. Rather, some of the contributions reflect the approach to culture offered by Weldes *et al.*, where

38 Norman Cousins, 'Modern Man is obsolete', *Saturday Review of Literature*, 18 August 1945, p. 5. See also Cousins, *Modern Man Is Obsolete*, New York: Viking Press, 1945, repr. London: Falcon Press, 1946.

39 Maya Deren, *An Anagram of Ideas on Art, Form and Film*, Yonkers: Alicat Book Shop Press, 1946, p. 10, repr. in Bill Nichols (ed.), *Maya Deren and the American Avant-Garde*, Berkeley: University of California Press, 2001, 267–322. We thank Dr Henning Engelke for pointing us towards this source.

40 John Canaday, *The Nuclear Muse: Literature, Physics, and the First Atomic Bombs*, Madison: University of Wisconsin Press, 2000, p. 24.

41 Michael W. Messmer, 'Nuclear culture, nuclear criticism', *Minnesota Review* (1988) 30, pp. 161–180, 161. Also see Messmer, '"Thinking it through completely": the interpretation of nuclear culture', *Centennial Review* (1988) 34, pp. 397–413.

42 Scott Zeman and Michael Amundson, 'Introduction', in Zeman and Amundson, op. cit. (35), pp. 1–9, 2.

43 Willis, op. cit. (5), p. 60.

44 Laucht, *Elemental Germans*, op. cit. (4), p. 5.

45 Holger Nehring, 'The British and West German protests against nuclear weapons and the cultures of the Cold War', *Contemporary British History* (2005) 19, pp. 223–241, 224.

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'culture' comprises 'the multiplicity of discourses . . . through which meaning is produced – including discourses about "culture" itself'. Furthermore, 'this multiplicity in turn implies . . . that meanings can be contested', and they 'understand culture to be composed of potentially contested codes of representation, as designating a field on which are fought battles over meaning'.[46] Many of the contributions to this special issue demonstrate that British nuclear culture as a concept must be contested, and the ways in which we access nuclear history must be open to the rich and varied approaches that nuclear scholars have developed in other national contexts. Lastly, we see some of the contributors using traditionally unrelated historiographical and conceptual traditions to frame new approaches to nuclear scholarship, confirming that approaches to nuclear culture must also be contested.

British nuclear culture: themes, approaches, perspectives

The contributions in this special issue involve close examination of a range of source materials, first, to demonstrate the rich, complex and contestable nature of the interactions between nuclear science, technology and British life and, second, to problematize how we choose to approach the nuclear past in Britain. Apart from Dan Cordle's piece on 1980s nuclear fiction, all articles concentrate predominantly on the first two decades after 1945. The genuine range of topics and approaches, as well as the vastness of the subject, makes it impossible to provide a holistic survey of 'British nuclear culture'. We have therefore arranged the articles in this special issue into three sections as a way of identifying some of the crucial themes and debates that have emerged.

The first part is devoted to three articles that offer explicit and extended attempts to reconceptualize 'British nuclear culture', illuminating in quite different ways the complex links between nuclear science, the state and the individual citizen. This section opens with an article by Jeff Hughes, who focuses on British nuclear culture 'from below' in his study of Ewan MacColl's play *Uranium 235* (1946). Hughes starts with a survey of nuclear historiography, including American atomic culture, which is intended to complement this introduction. He argues that 'nuclear culture' has too often been used only as an 'umbrella term . . . too general, too passive, too monolithic, too simplistic'. Through close analysis of the content, reception and broader significance of *Uranium 235*, Hughes offers a corrective to most extant understandings of British nuclear culture by suggesting that we must move towards a 'critical history of responses to nuclearization' by showing how these responses are 'collectively constitutive of the nuclear condition rather than passive reflections of it'. One factor that emerges from the article is the need to explore whether the interpretative category of 'class' can shape our understanding of nuclear history.

Richard Maguire then offers a novel conceptualization of nuclear cultures in government thinking about the Bomb in the 1950s and 1960s. His article deepens our

46 Jutta Weldes, Mark Laffey, Hugh Gusterson and Raymond Duvall, 'Introduction: constructing insecurity', in Weldes *et al.*, *Cultures of Insecurity: States, Communities, and the Production of Danger*, Minneapolis: University of Minneapolis Press, 1999, pp. 1–33, 2.

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understanding of how the British government and bureaucracy operated in the era of the H-bomb, and explores the actors involved in decisions concerning nuclear weapons. In common with Hughes, Maguire suggests that we need to move away from a single notion of nuclear culture, this time to understand more accurately 'the range of responses to nuclear weapons within government in the 1950s and 1960s'. He offers an analysis of official documentation that suggests that 'approaches to nuclear weapons policy generally were the products of varied frameworks of understanding, "nuclear cultures" that drew upon individual experience, political and social tradition, understandings of technology, and specific Cold War experience'. This suggests that when it comes to understanding government spheres of thinking on nuclear matters, historians must consider 'the nuclear' as an extremely problematic interpretative category that needs to be both properly historicized and precisely considered.

To end this section, Jonathan Hogg attempts to explore and define the nature of nuclear anxiety in the late 1950s. Using forgotten 'nuclear narratives' in the British press, including reports of a suicide pact in 1957, Hogg constructs an alternative picture of life in 1950s nuclear Britain that suggests that nuclear anxiety can also be linked to the construction of individual and collective identities. The article offers an alternative definition of Hecht's concept of 'nuclearity' that foregrounds the links between nuclear anxiety, assumptions over nuclear danger, and levels of nuclear knowledge. Hogg makes some tentative conclusions regarding how nuclear anxiety impacted on women's perceptions of motherhood and the family. One consequence of this approach is the suggestion that understandings of individual experience in the British post-war era can also be informed by the role played by nuclear anxiety, thus converging with Joseph Masco's recent work that sought to demonstrate the 'emotional history of the atomic bomb'.[47]

The second part of this issue is devoted to three articles that concentrate on aspects of the history of nuclear science – focusing particularly on intellectuals, nuclear scientists and enthusiasts – alongside analysis of the popularization of nuclear science, as well as the relationship between the state, nuclear science and its practitioners. This section focuses in particular on peaceful applications of nuclear energy and thus helps to redress the balance in the existing literature on civilian nuclear energy in Britain, which is still relatively thin. Whilst studies have addressed the world's first major reactor accident, at the Windscale nuclear power plant in Cumbria in 1957;[48] the impact that the foundation of the European Atomic Energy Community (EURATOM) had on Britain's role as a world leader in civilian nuclear technology;[49] British–Dutch–West German cooperation in centrifuge technology;[50] and government responses to the Chernobyl disaster in

47 Joseph Masco, '"Survival is your business": engineering ruins and affect in nuclear America', *Cultural Anthropology* (2008) 23, pp. 361–398, 387.

48 Arnold, op. cit. (11); Brian Wynne, *Rationality and Ritual: The Windscale Inquiry and Nuclear Decisions in Britain*, Chalfont St Giles: British Society for the History of Science, 1982.

49 Mervyn O'Driscoll, 'Missing the nuclear boat? British policy and French military nuclear ambitions during the EURATOM Foundation Negotiations, 1955–56', *Diplomacy and Statecraft* (1998) 9, pp. 135–162; John Krige, 'The peaceful atom as political weapon: Euratom and American foreign policy in the late 1950s', *Historical Studies in the Natural Sciences* (2008) 38, pp. 5–44.

50 Susanna Schrafstetter and Stephen Twigge, 'Spinning in Europe: Britain, West Germany and the Netherlands – uranium enrichment and the development of the gas centrifuge, 1964–1970', *Contemporary*

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1986,[51] no history of Britain's post-war civilian nuclear energy sector in the style of Joachim Radkau's economic history of the West German nuclear industry or Gabrielle Hecht's study of peaceful atomic energy and French national identity has yet been written.[52]

Paige Johnson offers an interpretation of the work of Muriel Howorth, atomic enthusiast and founder of the Atomic Gardening Society. Her article shows that non-government actors were capable of promoting optimistic views on civilian nuclear energy, pre-dating what is perhaps the best-known promotional campaign for atomic energy, namely US president Eisenhower's Atoms for Peace programme. Whilst Johnson concedes that 'Howorth's legacy must also be acknowledged as a minor one . . . her efforts notable more for their uniqueness than for their impact', it seems clear that Howorth's atomic activities can be seen as another example of the diverse ways in which individual citizens contributed to the broader narrative of British nuclear culture. This article also contributes to a comparatively underresearched area of British nuclear history, namely the role of women. As well as highlighting Howorth's self-promotion, Johnson argues that Howorth's role illuminates the intersections between, and significance of, 'expert and lay communities, government intervention in the popularization of science, [and] the response of women to the atomic age'.

Besides nuclear enthusiasts, the role played by 'organic' intellectuals in the shaping of nuclear understanding is an underdeveloped area in the historiography. In the next article, Ralph Desmarais reminds us that the role of intellectuals in Britain also took on added complexity after 1945, in part due to the advent of the atomic bomb. The insights offered by Desmarais suggest that the influence and power of prominent intellectuals need to be acknowledged as another crucial layer of our understanding of nuclear culture. Desmarais explores the role of intellectuals in British nuclear culture through a biographical case study of the polymath Jacob Bronowski, who was a literary scholar, scientist and science broadcaster and 'became one of Britain's most vocal and best-known scientific intellectuals engaged in the cultural politics of the early atomic era', in roughly the first decade after the war. Through the contextualization of key episodes from Bronowski's life and career – including his visit to Hiroshima shortly after the atomic bombing – this article illuminates broader questions on scientific responsibility, war and morality.

This section's final article, by Christoph Laucht, also addresses the social responsibility of atomic scientists after Hiroshima. It deals with a long-neglected yet crucial aspect of British nuclear history: the British atomic scientists' movement and its chief organization – the Atomic Scientists' Association (ASA), which atomic scientists formed

European History (2002) 11, pp. 253–272; Stephen Twigge, 'A baffling experience: technology transfer, Anglo-American nuclear relations, and the development of the gas centrifuge, 1964–1970', *History and Technology* (2003) 19, pp. 151–163.

51 Brian Wynne, 'Misunderstood misunderstanding: social identities and public uptake of science', *Public Understanding of Science* (1992) 1, pp. 281–305.

52 Hecht, op. cit. (31); Joachim Radkau, *Aufstieg und Krise der deutschen Atomwirtschaft 1945–1975: Verdrängte Alternativen in der Kerntechnik und der Ursprung der nuklearen Kontroverse*, Reinbek: Rowohlt, 1982.

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in 1946 as a consequence of their wartime work on the first atomic bombs in the Manhattan Project. Using the ASA's travelling Atom Train exhibition (1947–1948) as a case study, his article argues two key points. First, Laucht shows how the ASA intended to educate the British public more 'objectively' about nuclear energy matters, especially civilian applications of atomic power. In this way, the exhibition was intended to serve as a corrective to contemporary representations of atomic power in the form of two conflicting 'energy narratives' which David Nye has typified as 'the transformation narrative', which presented nuclear energy as an affordable and seemingly abundant energy source, and 'the apocalyptic narrative', which focused on nuclear weaponry.[53] Second, the piece demonstrates that the Atom Train formed a 'techno-political' site where atomic scientists' plans for public education clashed with the interests of the emerging national security state. This analysis of the complex intersections of the British state and the British atomic scientists' movement leads into the last section of this special issue.

Four articles in this final section examine the diverse ways in which the standard 'official' narrative of the atomic age can be disrupted by analysing the significance of fictional, journalistic and anti-nuclear narratives. These narratives need to be seen against the background of the British Cold War state, or 'the Secret State', as Peter Hennessy has termed it.[54] Elsewhere, David Nye has stated that 'the atomic bomb had come into being not as a result of open debate but as the result of a secret project that was never subjected to the normal controls of a democratic political process'.[55] Although British nuclear technology was developed within the framework of a liberal democracy, differing from atomic cultures in authoritarian states such as the Soviet Union, there are still tensions with regard to its legitimacy as part of a democratic nation state.[56] Nye continues, 'neither the public nor their elected leaders nor the scientific community was in control of the weapon; control had largely passed into the hands of the military'.[57] In the context of the United States, Garry Wills has even argued 'that the Bomb altered our subsequent history down to its deepest constitutional roots'.[58] David Vincent has demonstrated that, from the early days of the British atomic arms project, a 'culture of secrecy' defined British nuclear culture, restricting access to those areas that the authorities deemed to be of high importance to the national security state.[59] In contrast to the American or Canadian nuclear energy projects, Whitehall imposed a specifically rigid security regime on the early post-war project to avoid any leakage of information.[60] In the post-war era the British public received partial information

53 David Nye, *Narratives and Space: Technology and the Construction of American Culture*, New York: Columbia University Press, 1997, pp. 81–83.

54 Hennessy, op. cit. (16).

55 David Nye, *American Technological Sublime*, Cambridge, MA: MIT Press, 1994, p. 231.

56 Josephson op. cit. (33), pp. 299–300.

57 Nye, op. cit. (55), p. 231.

58 Garry Wills, *Bomb Power: The Modern Presidency and the National Security State*, New York: Penguin Press, 2010, p. 1.

59 David Vincent, *The Culture of Secrecy: Britain, 1832–1998*, Oxford: Oxford University Press, 1998, pp. 9–18, 194–210.

60 Gowing, op. cit. (10), pp. 126–127.

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about nuclear technology once it was filtered through D-notices and other official channels.[61]

It is in this broad context that Adrian Bingham, in the first article in this section, offers new perspectives on the press coverage of nuclear weaponry. By examining two mainstream newspapers, the *Daily Mirror* and the *Daily Express*, in the early atomic period, Bingham questions the extent to which newspapers contributed to 'official' nuclear discourse, as cultural commentators have previously argued. Dovetailing with Hogg's earlier assertions on the ambiguous nature of nuclear narratives in the early atomic era, the article also demonstrates the central role the press played in shaping British opinion on nuclear weapons and energy, often reinforcing nuclear anxiety.

Within this context of nuclear anxiety in the post-war era, anti-nuclear movements emerged, and debates in the historiography include the extent to which these movements shaped British opinion on nuclear weaponry.[62] In the next article, Jodi Burkett offers an exploration of changing attitudes towards environmental concerns within the most prominent anti-nuclear movement in Britain, the Campaign for Nuclear Disarmament (CND). Offering close analysis of *Sanity*, a monthly CND publication, she argues that a 'holistic, ecocentric, view of the planet was articulated first within CND' as one response to the conditions created by nuclear weapons testing. While environmental studies of the Cold War and nuclear issues more broadly are increasing, Burkett's piece contributes to the historiography on the long-neglected environmental history of Britain in the nuclear age.[63]

The special issue ends with two articles that focus firmly on fictional nuclear narratives and popular culture. David Seed offers an analysis of the Boulting Brothers' film *Seven Days to Noon* (1950), one of the first British films to address the nuclear threat. Embedding the film in its wider cultural context, the article analyses the narrative strategies employed in *Seven Days to Noon* to contain nuclear fear. Aligning the imagined 'nuclear subject' alongside real-world civil-defence planning, Seed suggests that the film implicitly presents tensions at the heart of British culture in the early 1950s. He argues that by the end of the film particular nuclear narratives 'resist closure', helping to explain why such films were likely to resonate profoundly with contemporary audiences.

In the final article in this special issue, Dan Cordle offers a rich analysis of British nuclear fiction during the 1980s which also contextualizes fictional narratives alongside civil-defence initiatives. He argues that lived experience in the 1980s was influenced by a nuclear culture that can be understood by analysing 'competing visions of society'. It was

61 Nicholas Wilkinson, *Secrecy and the Media: The Official History of the United Kingdom's D-Notice System*, London: Routledge, 2009.

62 Lawrence S. Wittner, *Resisting the Bomb*, Stanford: Stanford University Press, 1997; Wittner, 'Gender roles and nuclear disarmament activism, 1954–1965', *Gender and History* (2000) 12, pp. 197–222; Alison Young, *Femininity in Dissent*, London: Routledge, 1990; Mark Phythian, 'CND's Cold War', *Contemporary British History* (2001) 15, pp. 133–156; Nehring, op. cit. (45).

63 Lawrence Badash, *A Nuclear Winter's Tale: Science and Politics in the 1980s*, Cambridge, MA: MIT Press, 2009; Jacob D. Hamblin, *Poison in the Well: Radioactive Waste in the Oceans at the Dawn of the Nuclear Age*, New Brunswick: Rutgers University Press, 2008; J.R. McNeill and Corinna R. Unger (eds.), *Environmental Histories of the Cold War*, Cambridge: Cambridge University Press, 2010; Wynne, op. cit. (51).

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in the 1980s that literature made 'visible a nuclear threat that had, in the preceding decades, become so commonplace as to be mundane'. It is in this sense that Cordle, like Seed, constructs a very sharp impression of 'nuclear culture' as defined by individual artistic responses to, or visions of, nuclear anxiety. Thus nuclear culture is presented as the site where the nuclear subject is shaped by a necessarily politicized context.

This special issue offers a broad range of interpretations and approaches and signifies a shift away from 'top-down' nuclear history. As a contribution to our understanding of the nature of 'British nuclear culture', the variety of approaches offered here demonstrates the extent to which 'nuclear culture', as a concept, must not be treated as a monolithic idea. Approaches to the nuclear past must adopt a conceptually flexible lens in an attempt to understand and historicize the complex and varied ways in which nuclear technology contributes to, interacts with and influences human life.

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