PRIMARY AND SECONDARY SOURCES FOR BRITISH NUCLEAR HISTORY: SCOPING EXERCISE AND GUIDE TO SOURCES

Introduction

The last ten years have seen a dramatic increase in the amount of publicly available information on the story British nuclear history. This has been a consequence of the rolling 30-year rule on the release of informatio the end of the Cold War, and the slow but discernible erosion of the culture of secrecy that has hither surrounded the topic. As a result, it is now feasible to conduct a far more comprehensive study than has be possible in previous years. This ha s significant benefits, such as the democratization of information, and t opening up of a long-shrouded topic a llowing for more informed and nuanced debate over key questions British nuclear policy.

Perhaps less welcome is the possibility of a consequent reduction in quality control on the analyses of tho questions. A recurrent complaint at meetings of the Southampton study group on British nuclear history h been the often-poor understanding of technically based issu es by non-technical scholars. This has, of cours been in part a result of the fact that those scholars we re denied access to the relevant information or releva individuals. However, the price of democratizing access to information may be that many writers undertal tasks that would once have been undertak en (if they were undertaken at all) by a carefully selected and suitab qualified official historian.

That should not be read as an argument against open access to information. Rather, it is to highlight the quali control problems inherent in that ope nness: the problem of assessing authoritativeness. How is a reader approach a topic in which a rapid grow th in available source material has pr oduced a similar growth in analysi How are they to distinguish reliable analysis from unrelia ble? Since there will not be an official history regarded as the touchstone, inth e way that Gowing & Arnold's seminal *Independence and Deterrence* has bee it becomes necessary to produce a body of work written by, and/or under the supervis ion of, a group of peop with the necessary knowledge of technical, engineering, scientific and historical knowledge to verify that it is the required standard.

Such is the rationale for the project currently being established by the Mountbatten Centre for Internation Studies, and for the informal convention of weapons engineers, physicists, scientists and historians that meet 3 times per year to discuss British nuclear history. This report is designed to identify source material for t project, most of which consists of primary sources in the Public Record Office (PRO) and elsewhere, althou it also scans the available secondary sources in order to highlight where work has already been done. As mig

thefirstsubjectstobeheavilydeclassifiedandrequire less technical expertise. More sensitive, and sometim morecomplex,informationsuchasnucleartargeting,w eapons systems, and delivery systems development ha onlyrecentlybeguntobeopenedup,and also tend to require a more technically-informed eye if a rigorous a soundanalysisistobemade.

FollowingdiscussionsattheStudyGroupmeetings,fiveke y areas stood out as being ripe for serious analysis:

1. *AcquisitionofNuclearMaterials*
2. *TechnicalObjectivesofWeaponsDevelopment*
3. *DeliverySystemDevelopment*
4. *OperationalDeploymentofBritishNuclearWeapons*
5. *TheNon-ProliferationandArmsControlContextofBritishNuclearPolicy*

This report sets out the primary source material that is available at the Public Record Office (PRO) on the topics. Given the very large amount of information (t here are, for example, over 27000 files registered und theUKAEA'sseriesAB7alone),itisnotfeasibleto go into detail about the information. Rather, the repo aimstohighlighthowmuchinformationisavailableonwh ich subjects. It is, in short, a necessarily quantitati ratherthanqualitativeexercise.

One:TheAcquisitionofNuclearMaterial

This 'researchcluster' coverstheorganizationof nuclearenergyactivitiesintheUK,theproductionof nuclearmaterialsformilitarypurposes,andnuclearen ergyandthesecurityrelationshipwiththeUnited States.

ThePROhasaverylargeamountoffilesontheUnitedKingdomAtomicEnergyAuthority(UKAEA). A total of 92 files series are held under the refe rence AB, and include the records of the UKAEA's LondonOffice,NorthernGroup(ProductionDivision),the researchestablishmentsatHarwell,Winfrith and Culham, and the private papers of Sir John Co ckcroft, and of other pr ominent members of the authority.

The sheer volume of files makes a comprehensive account difficult, especially in light of the fact that this reference covers civil as well as military issu es. For the purposes of the British Nuclear History StudyGroup,themostrelevantfilesareasfollows:

Records of the UK Atomic Energy Authority's production divisions touching all aspects of atomic energy research, day to day procedures, administrative functions and industrial relations are in the AB series.

AB6

This series, open under the 30 year rule, contains 2677 files and reports concerning all aspects of atomic energy research carried out at Harwell, including research and development, buildings and works, senior management papers, contracts and stores, finance and accounts, general administration, health and safety, personnel and establishment, research reactors and reactor development, and scientific and technical administration. The series also includes some files relating to the Wantage Research Laboratory, the Radiochemical Centre, Amersham and Culham Laboratory, and papers relating to the Atomic Energy Establishment, Winfrith for the period that it was run as an offshoot of Harwell.

During the first year of operation most documents were issued in the form of committee papers. A list of reports is included in AB6/195. Each division was given an identifying prefix number for use on correspondence and the list has been groupedunder this number sequence with unregistered files at the end of their appropriate groups.

The numbers were allocated as follows:

1. Administration
2. Personnel and Accounts
3. Stores
4. Engineering Development Construction
5. Theoretical Physics Division
6. Health Division
7. Nuclear Physics Division
8. General Physics Division
9. Engineering Division
10. Metallurgy Division
11. Director's Office
12. Chemistry Division
13. Extramural Research
14. Planning, Progress and Procurement
15. Health Physics

AB7

This huge series (27,176 files covering 1944-90) includes reports and memoranda on various aspects of research, discussions, proceedings etc carried out by parts of the Northern Group, and related work carried out by other bodies and private companies. The majority of the reports are from the Risley Reports Library Series. Subjects covered by Northern Groups committees include scientific and technical developments, plant construction, site development, relations with clients, finance, health and safety, industrial relations and staff training.

AB8

This series contains 1171 files and reports, principally from 1946-54, concerning all aspects of atomic energy research carried out by Northern Groups including the establishment of Production Division of the Department of Atomic Energy, personnel matters, general and scientific and technical administration, housing, site accommodation, waste disposal, staff relations, training, recruitment, buildings and works and health and safety.

AB9

A total of 4126 files and volumes. They contain committee correspondence and papers classes for all UKAEA establishments. This includes the agenda, minutes, papers and other documents of all major committees, working parties, meetings and study groups.

AB12

863 files, covering the records of various committees and other groups based at Harwell. Subjects covered include scientific and technical developments, accommodation, health and safety, publications, standards, staff relations, relations with outside and international bodies, senior management policy and the environment. Also included are committees dealing with Winfrith when it was run as an offshoot from Harwell (1957-1961), and the Radiochemical Centre, Amersham.

AB16

This series is registered as having 4777 files, covering the period 1939-76. It contains registered files from the Ministry of Supply Atomic Energy Division's 330 file series, unregistered Atomic Energy Division files which were later given LO (London Office) numbers and placed in a miscellaneous series with other non-330 series files with various file series codes. From 1954 the series consists of files originating in the London Office of UKAEA. The subject matter covers the central administration and planning functions of the UK's atomic energy bodies, including organization, personnel and

building works, raw materials, health and safety, research and development, finance, procurement, accounts, contracts and commercial policy, legal matters and patents. There are files relating to all the UK's atomic energy sites and centres and to the Combined Development Agency.

AB19

(98 files) This series consists of private and official papers of Sir Christopher Hinton (later Lord Hinton of Bankside), during his period as deputy controller of the Atomic Energy (Production) Division of the Ministry of Supply (1946-1954) and managing director of the Industrial Group of the Authority (1954-1957). It includes various financial papers; copies of Hinton's general correspondence; files on staff and technical matters; papers concerning the transfer from the Ministry of Supply to the Authority; safety, training and visits files; eight volumes of registers of incoming correspondence (1950-1957); and a collection of private papers.

AB22

(54 volumes). This series contains the United Kingdom Atomic Energy Authority annual reports, as required by the Atomic Energy Authority Act 1954, section 3(5). All the reports (except the first) contain the accounts also. From 1956 to 1973 the reports were accompanied by illustrated summaries, the *Atom* series. Thereafter, illustrations are included in the main reports. From the 20th edition the illustrations are included in the main report. It also includes a published chronology of events for the years 1939 to 1978. The first report covers the period 19 July 1954 (when UKAEA came into being) until 31 March 1955; each subsequent report covers 1 April to 31 March.

AB24

This series contains files of the Establishment Directorate at Harwell, and of the Chemistry, Engineering, Electronics and Applied Physics, Metallurgy, Nuclear Physics and Process Technology Divisions. It has material on isotope production, accelerators, graphite and irradiation.

AB27

54 files. This series consists of private and official papers of Sir John Cockcroft, first director of the Atomic Energy Research Establishment, Harwell. These papers cover his wartime activities and his periods as Director of the Atomic Energy Research Establishment, Harwell and Member for Research of the United Kingdom Atomic Energy Authority.

AB38

2181 files, 30 year rule. This series consists of official papers of senior staff in Northern Groups, including NL Franklin, Sir John Hill, H Kronberger, V H B Macklen, P A Bundy, T Marsham, R V Moore, Sir Leonard Owen and J C C Stewart.

AB40

Australian Royal Commission into United Kingdom Nuclear Weapons Testing in Australia: photocopies of documents presented in evidence by the United Kingdom Atomic Energy Authority

AB41

This series consists of agenda, minutes, papers and correspondence of the United Kingdom Atomic Energy Authority London Office committees from 1962 onwards. It includes all the major policy-making bodies such as the Atomic Energy Executive and the Atomic Energy Authority. Subjects covered include nuclear policy, health and safety, liaison with other countries and internal policy.

AB65

This series includes papers concerning records management, patent matters, commercial activities, international co-operation and involvement with international bodies, and relations with commercial companies. There are also papers relating to the Dragon project dating from the time that the Atomic Energy Establishment, Winfrith was part of the Reactor Group (1961-1977), and papers relating to the development of a marine reactor.

AB73

This series contains the records of various committees and study groups based at Culham, and those of committees dealing with the Controlled Thermonuclear Research Project when it was located at Harwell, prior to relocation at Culham in 1960.

Other Sources

The deliberations of the Waverley Committee, which established the UKAEA in 1954, can be found in EG1/47-50. These files include correspondence, supporting papers, and minutes of the Committee. See also AB16/1075.

CAB 126 has a number of files on sources of uranium and thorium in the dominions and colonies, and elsewhere, and CAB 128 has files on nuclear acquisition and the establishment of the UKAEA.

DEFE7Politicalcontrolofnuclearweapons(subser iesofDEFE7).Openunder30yearrule.1958-64

Two:TechnicalObjectivesofWeaponsDevelopment

InADM1areanumberoffilesonnavalaspectsofnuc learwarfare,theimplicationsofnuclearpower forthenavy,thevariousBritishtests,SSBNdevelopmentandPolaris.

TheADM116serieshas12openfilesonoperationHu rricane. ADM204,whichcontainsthefilesof the Admiralty Research Laboratory, covers the Navy's radiological measurements for Operations Totem,Mosaic,andBuffalo.ADM205alsohasso mefilesonOperationMosaic,asdoesADM296(62 filesofpaperscollectedbyHughMartellontheMosaictests).

AIR2hasextensivefilesonsometec hnicalaspectsofdevelopment.Itincludeseffectivenessofatomic weapons,RedBeardfrom1957-71,Viol etClub,andsomeonYellowSun.Itsotherfilescoverseveral ORs,includingmegatonbomb(OR1136),theBlue Steelwarhead,lowaltitudebombing,RedBeard, ProjectE,andtheJointPlanningThreatAssessm entWorkingParty.Along withAVIA65,italsohas files on the abortive Operation Lighthouse (see al so ES 1/1097-1100). Files also on GRAPPLE, radiological contamination of aircraft and equipmen t. Further files on nuclear testing, including the Maralingaproject,OperationsBuffalo,Kittens,Mosa ic,Grapple,andAntler areavailableinAVIA65 series.

Informationonwarheadtrialsbetween1957and1962canbefoundinAVIA6,65and16.CABhas Joint Intelligence Committee, Missile Threat Co-Ordination Sub-Committee: Nuclear Warhead RequirementsWorkingParty.

Thepoliticalandmilitarydynamicsbehindweaponsde velopmentareinthewell-thumbedfilesofthe ForeignOfficeandWarOffice/MoD:FOandDEFEseries.

DEFE7

Thesegeneralfilescontainreferencesontheb uffaloandAntlertrials,possiblefuturenucleardeterrent weaponsystem,NuclearcapabilityinAustralia

DEFE19

This series consists of the files and papers of the Central Defence Scientific Staff, set up under the unified Ministry of Defence, together with papers inherited from its predecessors in the smaller, pre-

1964,MinistryofDefence.Theyincludepapersofthe ChiefScientificAdviser,hisassistantfornuclear mattersandpapersrelatingtoatomicenergyintelligence.

Available files include Weapons Development Co mmittee (Nuclear Sub-Committee), Effects of High-YieldNuclearWeapons,

Themoretechnicalsideofthestorycanbefoundin theEGandESseries,whichcontainrecordsofthe AtomicWeaponsResearchEstablishment(AWRE)relatingtoresearchinto,andthetestingof,Britain's atomicweapons.Asmightbeexpected,agreatdealof thefilesareretained,especiallythoserelatingto specificweapons.

ES1

Thisseriescontainsthe1658filesoftheRowley Collection.Manyofthesearetainedunder Section 3.4. The series covers the development of th e Atomic Weapons Research Establishment at Aldermaston, and early scientific and technical work on the British atomic weapons programme. The papers also cover the early organization necessary to set up the new research establishment such as staffing, building work, welfare matters etc. Also included are reports and minutes etc of various committees; papers concerning production of atomic weapons and their component parts; reports on earlyweapondesignworkandtrialsoftheweaponsandassociatedequipment.

Themajorityofthefilesareretained,butsomeareopenunderthe30yearrule,including:

- Blue/BrownBunny(atomicwarheadforBlueBoar)
- OperationLighthouse(pre-Grappletrials)
- Effectsofblastfromatomicweapons:investigationbyZuckerman
- UKAEAWeaponsGroup:papers,minutesandsecretary'smeetings.
- Permanentatomicweaponprovinggroundforoverseastrials(Maralinga)
- Nuclearweaponhazardsfromahypotheticalaircraftcrash
- AtomicWeaponsTrialsExecutive:minutesofmeetings
- OperationsTOTEM1&2:flashpropagation effectsfromatomicweaponexplosions

ES2

Reportsonbombsare inES2,butagainthebulkare retainedunder3.4.Theseriesconsistsofreports coveringthetheoreticalandpracticalaspectsofweaponandweaponcomponentdesign.

ES3

This contains 98 volumes for the period 1953-71, open under the 30 year rule. It covers studies on the physical effects of atomic weapons, studying mainly the blast and shock effects on structures, using scaled trials at Atomic Weapons Research Establishment, Foulness

ES4

1258 files (1953-70) under the 30 year rule, the research of most division at AWRE, except for weapons effects trials (E series reports, in ES3) and overseas trials work (T series reports in ES5). Many pieces contain photographs and plans.

ES5

376 files (1953-69), under the 30 year rule. The series describes the overseas trials work undertaken in Australia and the Pacific. See also the proceedings of the Australian Royal Commission on British nuclear testing in DEFE16.

ES6

85 files, 1958-66, 30 year rule. This series consists of reports produced by the Warhead Physics Department and successors and covers experimental nuclear research undertaken by the Atomic Weapons Research Establishment. Initiated in 1957, reports in the NR Series were identified by a letter (designating the subject) followed by a serial number. There are four types of report: NR/A (criticality of nuclear assemblies); NR/C (radiochemistry); NR/D (nuclear devices); and NR/P (nuclear physics). From 1963 until 1966 (when the series was discontinued) reports were issued serially within each year

ES7

9 files, 1962-66, 30 year rule. This series consists of reports produced by the Warhead Design Department into the practicalities of producing various weapon and warhead designs. The Warhead Design Department consisted of three divisions: the Weapon Engineering Division; The Weapon Diagnostics Division; and the Electronic Systems Division.

ES8

7 files covering 1955-9, 30 year rule. This series consists of the 'J' reports, analysing data derived from nuclear tests conducted by foreign powers. The series was discontinued in 1959, after which reports were referenced either by division or by a SEFT (Scientific Evaluation of Foreign Test) reference number.

ES9

56 files covering 1956-67, 30 year rule. This series consists of the 'R' reports, detailing work undertaken on the reactors at Atomic Weapon Research Establishment and other United Kingdom Atomic Energy Authority sites. The material selected includes early experimental work, materials interaction, safety tests and operating manuals

ES10

2204 files covering 1954-75, 30 year rule. These files contain the Theoretical Physics Notes (TPN), which were written mainly to aid and stimulate discussion within the Physics Division of AWRE. They represent the theoretical knowledge on which the trials and engineering work at AWRE was based. They highlight the problems encountered and detail the advances made in warhead design. They show areas of collaboration with the USA and summarise the status of weapon knowledge, design and methods of calculation at any given time. The series also gives information on service weapons and the scientific evaluation of foreign tests (SEFT). They are fundamental to the work undertaken at AWRE.

ES11

87 files covering 1955-74, 30 year rule. This contains Explosives Research Notes (ERN), produced by AWRE.

ES12

(open, 516 vols covering 1956-79) This series consists of miscellaneous reports, which were not produced centrally by the Atomic Weapon Research Establishment. The series contains directorate, divisional and miscellaneous referenced reports, including progress reports.

Most are listed under prefixes:

- The CWD prefix (pieces 7-16) indicates Chief Warhead Development.
- The GRO prefix (pieces 33-208) is thought to indicate Group Relations Officer. Most of these reports concern work undertaken for other government departments - the Ministry of Defence, Mintech and especially the Department of Health and Social Security (DHSS).
- The NRN prefix (pieces 295-307) are Nuclear Research Notes.
- The SEFT prefix (pieces 361-448) relates to the scientific evaluation of foreign tests.
- The SSPD prefix (pieces 453-502) indicates the Senior Superintendant Physics Division.

ES13

Files from 1954 onwards, open. Registered files cr eated by the AWRE Director's Private Office and successors. It contains reports, discussion documents, correspondence and policy papers.

ES14

1945-90, 30 year rule. This series contains unregiste red files and papers generated by senior officials within AWRE. The records describe the develop ment and implementation of nuclear weapons policy both within AWRE and between AWRE and Whitehall and contain personal papers, correspondence and memoranda. The series also contains a number of records used in the writing of official histories.

ES15

(not yet transferred) This series contains the minutes, papers and correspondence of major Atomic Weapons Research Establishment committees. It in cludes all the major policy-making bodies including the AWE Board and Directors Advisory Committee. Subjects covered include nuclear weapons policy, health and safety and warhead design.

See FO800 for the Makin spaper on Operations Epicure and Hurricane.

Three: Delivery System Development

The ADM series has a total of 136 files on nuclear submarines, principally their design and performance specifications. Includes:

ADM1 has 31 files on nuclear submarines, including

- Nuclear submarine and POLARIS Project 1957-8
- Submarine nuclear machinery: future research and development 1960-1
- The threat of the nuclear submarine 1957-8

In ADM 226 (the series covering vessel design and pe rformance), a total of 35 hits are recorded on nuclear submarines. They cover design specifications of the submarine, and appear to be open under the 30 year rule. ADM251 covers submarine propulsion machinery and equipment.

In the AIR 2 files (Air Ministry correspondence) are records on the development of medium and long-range bombers, Project E, guided w eapons, the megaton bomb OR, and Blue Streak. Most of these files are open access.

The files of AVIA 54 (Ministry of Supply) contai n technical and performance information on Blue StreakandBlackKnight. TheVbomberstoryiscove redinAVIA65,asareotherissuessuchasBlue Streak.Therearealsothreefileson"WS138A",themissilelaterdesignatedSkybolt.TheAIR20files comparingtheWS138AwiththeBritishBlueStreakis unfortunatelyclosed,buttheothertwofilesare availableinAVIA65(779and1262).Furtherinfo rmationonSkyboltcanbefoundinAIR2,including itscompatibilitywiththeVbombers,thedevelopment ofusage,andtheORtoreplaceit. Theclasses AVIA,DEFE,FO,andTreasuryfilesallcontainma terialonSkybolt,mostofwhichisopenaccess.

Committee and research reports for the Guided Proj ectile Establishment and its successor the Rocket Propulsion Establishment are in AVIA 1948. AVIA 68 carries technical reports from the Rocket Propulsion Establishment. This series consists of a series of technical memoranda and a series of technical notes on rocket development and fuel res earch which ran concurrently from the inception of theestablishmentin1958;theseriesalsoincludeshalfyearlyprogressreports.

DEFE 13/949 has files on nuclear attack submarin es and the general submarine programme (DEFE 13/949andDEFE25/46,respectively),BlueStreak,Skybo lt,Thoranditsattendantagreements,andthe TSR-2.

Files on Blue Streak development during 1960 are in an FO 371 subseries, and AIR and AVIA both haveopenfilesonThor,MRBM,andanti-ballisticmissiledevelopment.

Four:Operationaldeployment

Targetingisasensitivetopicandthussubjecttosecrecy.

AIR 2/13729 has a series on nuclear weapons, effects and targets 1953-9, strategic target policy for BomberCommand,maintenanceoftheBritishnuclearde terrent.AIR77/78coverstargetcoveragebya number of nuclear weapons. The files of the Work ing Party on Operational Use of Atomic Weapons canbefoundinAVIA65/1145-9.

DEFE24/166andPREM13.3126havein formationonorganisationanddeploymentofnuclearforces,a DEFE 24/76 Study on restrictions on the movements and deployment of nuclear weapons (1964-5) is scheduledforreleasein2006,andDEFE25hasfilesonNATOnuclearconsultations.

Regarding NATO deployment, this is another sensitive topic, as other states are involved. NATO is reportedly easing its notoriously tight hold on documents, but substantial information remains difficult to obtain. However, some is available. DEFE files include NATO Nuclear Planning Group, nuclear weapons and delivery systems in NATO, NATO's strategic concept, NATO consultation on nuclear matters. DEFE 25 has files on NATO Special Committee: Nuclear Planning Working Group, NATO nuclear force: assignment of V-bombers to SACEUR. DEFE 7/2090 contains information on targets for British naval nuclear forces assigned to SACLANT. AIR 2/13383 has files on coordination of nuclear strike operations 1953-70, AIR 8/1956 on control of nuclear weapons in NATO Europe, AIR 8/2288 on employment of nuclear weapons by NATO. See also T 225/2072 for 'Nuclear weapons: control and deployment in NATO'. ADM 1/27203 covers the Holy Loch facilities (Project Lamarchus) 1960-4.

The FO 371 files have information on possible NATO nuclear deterrent, use of nuclear weapons by NATO armed forces, nuclear consultation within the Alliance, NATO strategy and the nuclear deterrent.

There are a large amount of files on Nassau and the MLF/ANF debates of the early 1960s, in FO 371. See also Treasury files in T225.

The Non-Proliferation and Arms Control Context

For the development of IAEA safeguards, see EG 1, 681 files of successive departments responsible for atomic energy policy. They include bill papers, files on health and safety and on control of the export of equipment, minutes and papers of the Atomic Energy Board and files on international co-operation, including liaison with the International Atomic Energy Agency, and Common Market negotiations for UK accession to EURATOM.

On the possibility of a test moratorium and/or test ban, see the 196 references in FO 371. Beginning in 1960, the files cover issues such as the attitudes of states such as France and China, UK participation in US-Soviet negotiations, the Geneva Disarmament Conference, inspection and verification issues, and the use of un-manned seismic detection stations in conjunction with a Test Ban Treaty. See the DEFE 7 files for the records of the Nuclear Tests Policy Committee. Protocols to treaties can be found in FO 93.

Cabinet-level discussions on test bans, nuclear disarmament and the Geneva negotiations can also be found in CAB 128, 129, and 134.

PreliminaryConclusions

This report is designed to give an indication of how much primary source material is available for a series of studies. The sheer volum e of material means that it can only give a glimpse, and in fact it might be easier to report on what is still retained, rath er than what is available. The report will shortly be expanded with a fuller listing of relevant material, and a clearer picture of retained material, but the scan reveals a wealth of information on the organi zational, political and strategic aspects of British nuclear history.

The strongest controls remain on the technical and ta rgeting aspects of the story, and thus it would be difficult to write a comprehensive history series on su chissues that relied on primary source information from the PRO. It will be necessary to supplem ent work with oral history and advice from the Southampton Study Group. That is not to say that a technically-informed study is infeasible: a recent paper demonstrated that work on technical developmen t is possible, but it also showed the invaluable role played by the Study Group in providing info rmation, advice and guidance under the Chatham House Rule.