

Catalogue of the papers and correspondence of

**SIR GEORGE PAGET THOMSON FRS**

(1892-1975)

Compiled by Jeannine Alton and Julia Latham-Jackson

Deposited in the Library, Trinity College,  
Cambridge

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British National Committee for the History of Science, Medicine and Technology

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## GENERAL INTRODUCTION

### PROVENANCE

Most of the material was received from the Thomson family via Trinity College, Cambridge.

The bound volumes of Thomson's autobiography (A.14), of his published papers (A.51, A.52), and of his own selection of letters from his wife Kathleen (A.14 A), are included by courtesy of Mr. D.P. Thomson.

The photocopy of the letter by Thomson at J.119 has kindly been made available by the Right Reverend the Bishop of Ely.

### CAREER AND WORK OF G.P. THOMSON

Thomson was born in Cambridge in 1892, into a family of scientific distinction on both sides. His father, Sir Joseph Thomson (always known as 'J.J.'), was one of the foremost physicists of the day, Director of the Cavendish Laboratory, Cambridge, and in 1906 awarded the Nobel Prize for Physics for his discovery of the electron. His son George was much guided and influenced by his father, conducting early collaborative research with him and having access through him to current work on the frontiers of knowledge, as his later historical writings frequently testify. Thomson's collaboration with his father continued for many years and included joint work on the Third (1928) Edition of Conduction of Electricity through Gases.

After education at the Perse School and Trinity College, Cambridge, Thomson began research in 1913 at the Cavendish Laboratory under his father's supervision, and was elected a Fellow of Corpus Christi College in 1914. During the First World War he was attached to the Royal Flying Corps at the Royal Aircraft Factory (later Establishment) at Farnborough, where he was a member of the famous 'Chudleigh Mess' and formed lasting friendships with F.W. Aston, W.S. Farren, B.M. Jones, F.A. Lindemann (later Lord Cherwell), G.I. Taylor and others.

At the end of the War he returned to Cambridge, and in 1922 was appointed Professor of Natural Philosophy at the University of Aberdeen. Here his most famous work was done, on electron diffraction by thin films (1926-28), for which he shared with C.J. Davisson the Nobel Prize for Physics in 1937.

In 1930, after a visit to America lecturing and working at Cornell, Thomson, now a Fellow of the Royal Society, moved to London as Professor of Physics at Imperial College. He continued work on electron diffraction and tried to develop it as a research tool for the study of surfaces, and also encouraged electron microscopy. A protracted illness which declared itself early in 1936 seriously interrupted his experimental work and marked the effective end of his work on electrons. Instead, he pursued the interest in nuclear physics begun a few years earlier, and in 1939 was quick to see the possible military implications of current work in nuclear fission. His professional knowledge, and his personal acquaintance with leading scientists and government advisers enabled him to initiate investigations, especially as (from April 1940) Chairman of the MAUD Committee which reported on the feasibility of an atomic weapon.

During the Second World War, subsequent to his work on the MAUD Committee, and after two years at the Royal Aircraft Establishment, Farnborough, Thomson was sent as Scientific Liaison Officer to Canada. At this time, his wife Kathleen was seriously ill in America; her death at the end of 1941 was a great blow to him. He remained in Canada until summer 1942 after which he returned to Britain to become Deputy Chairman of the Radio Board (1942-43) and Scientific Adviser to the Air Ministry (1943-44). He resigned this post in December 1944 to resume work at Imperial College. He was knighted in 1943.

His scientific interests now centred on the study of cosmic rays and mesons, and on nuclear fusion - itself a development of a theory of an electrodeless discharge put forward by 'J.J.'. Under Thomson's guidance, work on an electrodeless torus proceeded at Imperial College and was provisionally patented in 1946; the team subsequently transferred to the A.E.I. laboratories at Aldermaston, while similar work was also in progress at Harwell. Both groups produced an apparatus - SCEPTRE at A.E.I., ZETA at Harwell - which attracted much attention when they were brought to the notice of the general public in 1958.

In 1952 Thomson returned to Corpus Christi College, Cambridge, as Master; he remained there until 1962 and spent his retirement in Cambridge, where he died in 1975.

## DESCRIPTION OF THE COLLECTION

The material includes notebooks, manuscript notes and drafts, drafts for lectures and papers (many unpublished or additional to those listed in the Bibliography compiled for the Royal Society Memoir of Thomson), photographs and slides of experimental results, and correspondence.

Of considerable interest are the drafts and text of Thomson's autobiography covering his career to 1966; this document, which he had written primarily for his family, is included at A.2 - A.14 and has, with permission, been drawn upon in compiling some of the catalogue entries. It is an important source of information for some of the 'gaps' in the surviving manuscripts, particularly for such matters as Thomson's activities in the Second World War (other than the MAUD Committee), his many foreign visits and his public commitments. In his introduction to the autobiography, Thomson mentions his inability to write adequately of his wife Kathleen, and of his hope to compile a selection of her letters to him; bound copies of the autobiography, and of the letters, have been made available by Mr. D.P. Thomson and appear at A.14, A.14 A respectively.

Thomson's scientific research on electron diffraction is well documented by notebooks, lectures and slides; his contribution to thermonuclear research, on which he was able to publish very little because of the demands of security, survives mainly in the form of manuscript notes and drafts (see Section E). Unfortunately, it is clear that much has been lost of the early correspondence on electron diffraction.

Thomson's service to the Royal Society, The Institute of Physics, the British Association and many other learned societies, is also very scantily documented.

Thomson's own distinguished contribution to scientific knowledge, together with his admiration for his father and early acquaintance with eminent men of science, made him always aware of the history of science and its practitioners. He wrote and lectured widely on these subjects, often for anniversary celebrations of various kinds, and also contributed many obituary tributes for individual scientists, many of them his personal friends. He frequently assembled information and

recollections additional to those which appeared in the final publication, but which survive in the collection. Material relating to his historical and biographical writings on 'J.J.' can be found in the collection of papers of J.J. Thomson (CSAC no. 74/4/80) in the Library of Trinity College, Cambridge.

In addition to an historical awareness, Thomson was also conscious of the impact of science on many aspects of life and thought. Section H groups together his lectures and writings on science-related topics of this kind; it includes inter alia material on his work for the Voluntary Euthanasia Society which occupied much of his interest in his later years.

#### LOCATIONS OF OTHER MATERIAL

Thomson's original electron diffraction camera was deposited in the Science Museum, London, in 1948 (see J.107).

Material relating to the Thomson and Paget families remains in family hands.

#### ACKNOWLEDGEMENT

The help of Dr. M.J. Whelan, FRS, Reader in the Physical Examination of Materials in the University of Oxford, in identifying material relating to electron diffraction, is gratefully acknowledged.

#### ENQUIRIES

Enquiries should be addressed in the first instance to The Librarian, Trinity College, Cambridge.

SECTION A      BIOGRAPHICAL AND AUTOBIOGRAPHICAL      A.1 - A.53

A.1      Obituaries and tributes.

Biographical Memoirs of Fellows of the Royal Society,  
23, 1977, pp.529-556 (by P.B. Moon).

Contemporary Physics, 17, no.1, 1976.

The Times, 12 September 1975.

2 pp. account of Thomson's life and work, by O.R.  
Frisch, n.d. [1975].

Photocopy of a printed collection of messages and  
photographs assembled by Thomson's younger daughter,  
Rose Bell, in honour of his 80th birthday (see Moon,  
Memoir, p.549). Contributors include many of  
Thomson's friends as well as members of his own family.

A.2-A.14      Autobiographical material.

The main source is Thomson's draft autobiography (A.2-  
A.12) in a series of notebooks and loose pages, most auto-  
graph manuscript but including some typed-up sequences.  
Some additional notes and material are included in A.13.

Of his autobiography, Thomson wrote (A.2): 'This book  
has been written for my children and grandchildren, in the hopes  
that the former may be interested in reading of events they  
remember or have heard about and that the latter as they grow  
up may enjoy hearing about the homes in which their parents  
lived, and the family into which they have been born. It is  
not meant for publication, but I have no objection to suitable  
extracts being published at John's discretion [ Sir John Adam Thomson,  
KCMG ], or at David's [ Mr. D.P. Thomson ] if John happens  
to be out of England. A copy may be lent to whoever the Royal  
Society selects to write the usual biographical memoir. I did  
not feel able to write about Kathleen [ Kathleen Buchanan, née  
Adam Smith ], but hope to have a few copies made of a selection  
of her letters which may give a better idea of her than I can hope  
to do.'

A bound copy of the complete autobiography appears  
at A.14; a volume of Kathleen Thomson's selected letters  
is included at A.14A.

Biographical and autobiographical

- A.2      Spiral-bound notebook, 'Autobiography 1', with loose pages inserted.  
            Ms. and typescript.  
            Childhood, family and early days to 1901 when Thomson entered King's College Choir School.
- A.3      Spiral-bound notebook, 'Autobiography 2', with loose pages inserted.  
            Ms. and typescript.  
            'Chapt. II', King's College Choir School, and the Perse School, Cambridge.  
            The book is used from the back. At the front of the book are several pages of notes on Determinism.
- A.4      Spiral-bound notebook, 'Autobiography 3. Trinity Years', with loose pages inserted.  
            Ms. and typescript.
- A.5      Spiral-bound notebook, 'Autobiography 4. Trinity (Continued), 1st World War, Corpus', with many loose pages and longer sequences inserted.  
            Ms. and typescript.  
            Narrative continues to include 'Chapter VI' on Corpus Christi College, further material for 'End of Chap. VI' on the Thomson and Paget families, 'Chap. VII' on Aberdeen.
- A.6      Spring-back binder, 'Autobiography 5. Aberdeen and early Imperial College. Visit to Rumania', with an additional sequence.  
            This covers Thomson's marriage, and his most famous scientific work on electron diffraction.
- A.7      Spiral-bound notebook, 'Autobiography 6. Illness, War', with many loose pages inserted.  
            Ms. and typescript.  
            This covers the award of the Nobel Prize, Thomson's serious illness 1936 and 1937, the MAUD Committee, Kathleen Thomson's death, various Second World War activities, to August 1945.  
            Rear of book contains lists of Committees on which Thomson served, often as Chairman.

Biographical and autobiographical

- A.8           Spiral-bound notebook, 'Autobiography 7. Post War London', with some loose pages.  
Ms. Narrative includes visit to Pakistan, 1952, and became 'Chap. X'.
- A.9           'United Nations XI'.  
Ms., on 'Atomic Energy Commission of the United Nations, 1946-47' and 'Thermonuclear'.  
Narrative continues to about 1963.
- A.10          'Chap. XII. Activities and organisations'.  
Envelope of ms. narratives on 'Institute of Physics', 'Schools', 'Government Research', 'Committees', 'Clubs', 'Lectures', 'Books', 'Pugwash Conference', 'British Association'.
- A.11          'Chap. XIII. Return to Corpus'.  
Ms. narrative, and spiral-bound notebook 'Autobiography 8' describing visits to Malta (1963), and Holland and a note on portraits of Thomson. (These are drafts for parts of 'Chap. XIV' below.)
- A.12          'Chap. XIV. Visits and Holidays'.  
Envelope of various ms. and typescript narratives.  
The last page is Thomson's conclusion, dated November 7, 1966, in which he says 'I count myself strangely and singularly blessed'.
- A.13          Folder of miscellaneous material and notes assembled for autobiography.  
Includes:  
Lists of Hon. degrees, committees, holidays, landmarks in family history, summary diary of events 1949-62.  
4 pp. account of 'Sixth Form Mathematics at The Perse, 1906-1910', sent with covering letter to A.C. Hawkins, probably for a history of the school, 1969.

Biographical and autobiographical

- A.14      Spiral bound duplicated typescript text of the complete autobiography; Thomson had a few copies prepared for presentation to members of his family and this one is included in the collection by courtesy of Mr. D.P. Thomson.
- A.14A     'Kathleen's letters to G.P.T.'  
            Duplicated typescript, 168 pp.  
  
            This is a copy of the selection of Kathleen Thomson's letters to which Thomson refers in A.2, kindly made available by Mr. D.P. Thomson.  
  
            The Foreword, by Thomson, is dated 28 June 1968, and the letters run from 20 March 1924 to 1 December 1941. Kathleen Thomson died on 22 December 1941.
- A.15      Envelope annotated by Thomson 'My first published work'. Contains copy of an essay by Thomson entitled 'Effect on Naval Warfare of Substitution of Steam for Sails', published in The Navy League Journal, December 1906 as the result of the award of their annual prize to Thomson, then aged 14.  
  
            His interest in ships continued throughout his life, and the autobiography contains many pleasant accounts of sailing holidays with friends or family.
- A.16, A.17      2 lectures on aeroplanes.  
  
            Neither of the lectures is dated, but they were probably delivered soon after the First World War, perhaps in Cambridge.  
  
            See K.40, K.41 for 2 boxes of slides relating to these lectures.
- A.16      'How an aeroplane flies'. 1 p. ms. notes followed by typescript with ms. corrections.
- A.17      'The Science of Flight'. 12 pp. typescript with some ms. corrections.  
  
            Some printed matter is also included in the folder.

Biographical and autobiographical

- A.18-A.23 Ms. notes and drafts for various speeches, delivered in Cambridge or relating to Cambridge University affairs, 1953-69.
- A.18 1953, 1957
- 'Speech to Middlesex C.C. scholars', 24 September 1953.
- Speech on retirement of George Lewis, 4 October 1957.
- A.19 1958, 1960
- Speech on retirement of C.D. Bicknell, 8 January 1958.
- Speech at Marlowe Society Dinner, 17 November 1958.
- Ms. and typescript notes and drafts for broadcast on the Cavendish Laboratory, December 1958.
- Notes for talk delivered to Cambridge University Natural Science Club, February 1960.
- A.20 1962-63
- Speech at Cambridge Society of York Dinner, 21 February 1962.
- 'Speech in the Senate House', 22 May 1962.
- Speech at Corpus Association Dinner, 6 July 1962.
- Speech at Feast of the Commemoration of Benefactors of Trinity College, Cambridge, 15 March 1963.
- A.21 1964, 1966
- Speech on opening of the George Thomson Building, Leckhampton, 10 October 1964.
- 'Discussion on Deer Report. Statement by Sir George Thomson', 7 March 1966. 2 copies, one annotated.
- A.22 1968, 1969
- After dinner speech at 2200th Meeting of Cambridge University Natural Science Club, 30 May 1968.
- Speech on retirement of T. Shand, 30 September 1969.

Biographical and autobiographical

A.23

n.d. Includes:

Speech at inauguration of King's College School  
Assembly Hall.

Speech delivered at Perse School (prizegiving?).

Notes for speech to True Blue Club.

Speech re Corpus Boathouse.

Biographical and autobiographical

- A.24-A.33      Honours, awards, membership of societies
- A.24      Award of Howard N. Potts Gold Medal of The Franklin Institute, Philadelphia.      1932  
Correspondence re award; Thomson was unable to attend the ceremony, and the medal was received on his behalf by the British Consul General.
- A.25      Conferral of Hon. D.Sc., University of Lisbon.      1935
- A.26      Correspondence re Nobel Lecture.      1938  
Thomson was awarded the Nobel Prize in November 1937 but was unable, for reasons of ill-health, to travel to Stockholm to deliver his Nobel Lecture until June 1938.  
For typescript of the Lecture, see F.78.
- A.27      Letters of congratulation on Knighthood.      1943
- A.28      Certificate of Membership, Society of Instrument Technology.      1945  
See G.26-G.28.
- A.29      American Academy of Arts and Sciences.      1947  
Election as Foreign Honorary Member; certificate and correspondence.  
American Physical Society.      1947  
Election as Member; certificate.
- A.30      Conferral of Hon. Ll.D., University of Aberdeen.      1948
- A.31      Award of Royal Medal of the Royal Society.      1949  
Letters of conferral; letters of congratulation.
- A.32      Nomination as Honorary Councillor, Consejo Superior de Investigaciones Cientificas, Madrid.      1950
- A.33      Conferral of Associateship, Royal College of Science.      1951  
Farewell dinner and presentation to Thomson on his departure from Imperial College.      1952  
Programme of events, Thomson's ms. speech in reply.

Biographical and autobiographical

- A.34-A.42      Correspondence re various committees.
- See also Section D, especially D.10-D.28 (MAUD Committee).
- A.34      Committee on the Education and Training of Students from Overseas, set up by Board of Education and Board of Trade.      1933  
            Correspondence, report.
- A.35      Royal Observatory, Greenwich.      1944  
            Renewal of invitation to serve on Board of Visitors.
- A.36      Copy of letter re Thomson's journey to U.S. as temporary replacement of Chadwick on U.K. Delegation to Atomic Energy Commission.      1946  
            Invitation to serve on Church Assembly Commission on Atomic Power. (Correspondence continues to 1948.)      1946
- A.37      Paper on organisation and functions of Scientific and Technical Intelligence Committees, sent for information to Thomson as member of the Joint Committees.      1947
- A.38      Correspondence re Scientific Advisory Panel, and re consultancy, Ministry of Defence.      1950
- A.39      Brief correspondence re University of London committees, and Old Centralians.      1950
- A.40      Invitation (declined) to serve on Science Museum Advisory Council, newly reconstituted.      1951
- A.41      Invitation to serve on Advisory Committee, U.K.A.E.A., set up in relation to the history of the Authority to be written by M.M. Gowing.      1961
- A.42      Brief correspondence with U.K.A.E.A. re classified papers returned by Thomson.      1968

Biographical and autobiographical

- A.43 Brief correspondence of biographical interest. Includes:  
Thomson's letter to Commissioner of Metropolitan Police, requesting permission to buy ammunition for his 'war trophy' pistol, in connection with his experiments at Imperial College on the deformation of metals under stress. 1938  
Correspondence re Thomson's cousin, Meyrick Paget, missing after the capture of Singapore. 1945  
A photograph of Thomson is also included in the folder.
- A.44-A.48 Financial affairs
- A.44 Correspondence with Imperial College, 1937-51, re Thomson's F.S.S.U. policies, family allowances, College accounts and expenses.
- A.45 Correspondence with bank and brokers re shares, dividends, etc., 1947-51. Includes a little correspondence re estate of J.J. Thomson, 1947.
- A.46 Correspondence and notifications of salary or consultancy fees, from:  
Ministry of Defence, 1943, 1947  
Foreign Office, 1947  
Associated Electrical Industries Limited, 1950-51  
Paul Instrument Fund Committee, 1950-51  
Endeavour, 1948.
- A.47 Shorter correspondence re subscriptions.
- A.48 Shorter personal accounts.
- A.49 Miscellaneous personal notes and jottings.
- A.50 Requests for autographs or biographical information.

Biographical and autobiographical

- A.51, A.52      2 bound volumes containing a set of Thomson's published papers arranged in chronological order.
- A.51            1920-49  
                    2 sets of ms. notes by Thomson on one of his papers are clipped to the relevant offprint.
- A.52            1950-61  
                    Book reviews and other shorter articles, some undated, are included at the back of the binder.
- A.53            Box containing loose offprints of Thomson's papers (incomplete set).

SECTION B      EARLY NOTEBOOKS AND RESEARCH, 1905 - 1922    B.1 - B.39

This Section documents aspects of Thomson's education at the Perse School and Trinity College, Cambridge, and his early research conducted at the Cavendish Laboratory under the direction of his father immediately before and after the First World War.

The material is presented as follows:

- B.1 - B.10    School notebooks 1905-10
- B.11 - B.31    Cambridge University. Undergraduate notebooks and early research 1910-14
- B.32 - B.39    Research in Cambridge 1919-22

Many of Thomson's notebooks were re-used at different periods of his life; sometimes the old pages were torn out, sometimes he restarted from the back of the book. Occasionally a single notebook contains very diverse material, such as B.2 (school exercises at one end and personal accounts for 1924-26 at the other) and E.60 (school exercises followed by notes on thermo-nuclear research).

See also D.17 in the collection of J.J. Thomson (CSAC 74/4/80, in Trinity College, Cambridge), a notebook containing mathematics notes from Thomson's undergraduate days which he later used for his father's biography.

Early notebooks and research

B.1-B.10 School Notebooks 1905-10

The earliest of these dates from Thomson's first year at the Perse School, Cambridge, and the subjects covered include English literature and the classics as well as science and mathematics. During his last year at school he attended A. Wood's lectures at Cambridge University, and his notes on these appear at B.5 - B.7.

- B.1 Dilapidated hard-cover notebook with part of front cover missing, bearing the legend 'Physics. Magnetism Electricity and Light as learnt by G.P. Thomson since the year 1'.

Contains school exercises from 1905. Very few entries are dated, but they probably continue for about 2 years.

- B.2 Hard-cover notebook inscribed inside front cover 'Thomson. Literature. Oct. term 1905'.

Contains school exercises, October 1905-July 1906.

The back of the book contains accounts of personal expenditure, November 1924-October 1926.

- B.3 Hard-cover notebook containing notes by Thomson on ancient Greek history and culture, n.d., c.1906-7.

- B.4 Hard-cover notebook containing notes on mechanics and electricity, n.d.

- B.5 Hard-cover notebook inscribed inside front cover 'Thomson. Light. Summer Term 1907', with a later annotation by Thomson 'Alex Wood's lectures 1908 or 9'. Some pages have been torn out of the front of the book - presumably the material on light. A few loose pages of notes, all in Thomson's hand, have been left in situ.

- B.6 Hard-cover notebook labelled 'Light. G.P. Thomson', with a later annotation by Thomson 'Alex Wood's lectures 1909'.

- B.7 Hard-cover notebook labelled 'G.P. Thomson. Light (2) and Sound', with later annotation by Thomson inside front cover 'Alex Wood's lectures 1909'.

Early notebooks and research

- B.8 Hard-cover notebook labelled 'Perse Grammar School. Thomson. VI special'. Inside front cover is the heading 'Geometrical Conics'.

Thomson mentions in his autobiography (A.3) that during his last year at school he was coached in 'modern geometry' by H.W. Turnbull, and the notebook presumably dates from this period.

- B.9 Hard-cover notebook containing notes on 'Conic Sections', n.d., c.1909-10 (see B.8).

- B.10 Soft-cover notebook containing account by Thomson of 'Experiments made May-July 1910' on the first 3 pages. Most of the rest of the book has been left blank.

Early notebooks and research

B.11-B.31 Cambridge University. Undergraduate notebooks and early research, 1910-1914

The majority of these contain notes on lectures attended by Thomson during this period, including some by his father (B.26, B.27, B.30).

Item B.31 documents Thomson's first research at the Cavendish Laboratory, where he began work on positive rays under his father's direction in the summer of 1913, to be interrupted a year later by the outbreak of war.

- B.11 Hard-cover notebook with much later annotation by G.P. Thomson 'G.A. Herman's coaching'. The first entry is dated October 1910, but most of the subsequent entries are undated.

In his autobiography (A.4) Thomson recalls that he and five others went to G.A. Herman three times a week for private coaching. 'It cost nine guineas a term, quite a sum in those days ... The coaching was really a set of lectures, but examples were set and each morning he went through those set last time ... The actual lecture was given fairly fast and our notes were often incomplete, but we used to meet afterwards in someone's rooms and learned a lot in the process of sorting them out. If the lectures had been free we should probably not have taken this trouble, to our loss.'

- B.12 Orange cloth-covered notebook labelled 'G.P. Thomson. Trinity College. Invariants', with annotation by Thomson inside front cover 'Herman coaching date?'

- B.13 Hard-cover notebook with barely legible label 'Algebra. Thomson', and annotation by Thomson inside front cover 'Herman coaching date?'. Some pages, presumably containing school exercises in algebra, have been torn from the front of the book. A bundle of loose notes has been left in place inside the book.

- B.14 Blue cloth-covered notebook inscribed inside front cover 'G.P. Thomson. Trigonometry and Fourier Series. May Term 1911. Notes from Mr. Herman'. Contains a bundle of loose notes which has been left in situ.

- B.15 Red cloth-covered notebook inscribed inside front cover 'G.P. Thomson. Trinity College. Astronomy. Notes from Mr. Herman. October 1911'. Contains a few loose pages which have been left in situ.

Early notebooks and research

- B.16 Green cloth-covered notebook inscribed inside front cover 'G.P. Thomson. Trinity College. Rigid Dynamics. Notes from Mr. Herman. October 1911'.
- B.17 Hard-cover notebook labelled 'Dynamics of a particle and Rigid Dynamics. G.P. Thomson. Trinity', with a note in Thomson's hand inside front cover '[illegible] Dyn. of a Part. & Rigid'. n.d.
- B.18 Black cloth-covered notebook inscribed inside front cover 'G.P. Thomson. Trinity. Integral Equations. Prof. Hobson'. n.d., c.1910-12.
- B.19 Hard-cover notebook with later annotation by Thomson 'Lectures by Barnes'. The first entry is headed 'Differential Equations'. n.d., c.1910-12.
- B.20 Hard-cover notebook labelled 'Elliptic Functions. G.P. Thomson. Trinity', with a later annotation by Thomson 'Berry's Lectures'. n.d., c.1910-12.
- B.21 Dark red cloth-covered notebook inscribed inside front cover 'G.P. Thomson. Trin. Coll. Electric Waves and Electro-optics by Dr. Bromwich. Easter 1912'.
- B.22 Dark red cloth-covered notebook inscribed inside front cover 'G.P. Thomson. Trinity College. Electro-magnetism. Notes from Mr. Bromwich'. n.d.
- B.23 Pale blue cloth-covered notebook inscribed inside front cover 'G.P. Thomson. Trin. Coll. Hydrodynamics & Sound. Mr. Cameron. May 1912'.
- B.24 Black hard-cover notebook inscribed inside front cover 'G.P. Thomson. Trinity College. Cambridge. Long Vacation 1912'.
- Contains accounts of experiments to Lent Term 1913.
- B.25 Hard-cover notebook inscribed inside front cover 'G.P. Thomson. Trinity. Lectures from Mr. Searle. Oct. 1912'.
- At the back of the book is a brief note headed 'Scattering of Röntgen Radiation'. n.d.
- B.26 Soft-cover notebook labelled 'Electricity and Matter. Sir J.J. Thomson. Oct. 1912'. Lecture notes continue to Lent Term 1913.

Early notebooks and research

- B.27 Red cloth-covered notebook inscribed inside front cover  
'G.P. Thomson. Sir J.J. Thomson. March 1913.  
Electricity and Matter'.  
(Continuation of B.26.)
- B.28 Hard-cover notebook inscribed inside front cover  
'G.P. Thomson. Electrical Measurements. Searle 1913'.
- B.29 Beige cloth-covered notebook labelled 'G.P. Thomson.  
Optics'.  
Contains notes on lectures. n.d.
- B.30 Orange cloth-covered notebook inscribed inside front cover  
'G.P. Thomson. Trin. Coll. Structure of the Atom.  
J.J. Thomson'. n.d.
- B.31 Soft-cover notebook labelled 'Positive Rays 1913-14'.  
Contains notes on laboratory experiments (not all in  
Thomson's hand). July 1913-June 1914.

Early notebooks and research

B.32-B.39 Research in Cambridge, 1919-1922

After the First World War Thomson returned to the Cavendish to resume the work on positive rays, turning later to anode rays with which he discovered, simultaneously with F.W. Aston, that lithium comprises two isotopes of masses 6 and 7.

The notebooks continue to May 1922, after which Thomson accepted an appointment as Professor of Natural Philosophy at Aberdeen University.

- B.32 Hard-cover notebook with later annotation by Thomson 'Stratton on Spectroscopy'. A few pages (presumably containing school exercises) have been torn from the front and back of the book. At the back of the book there are two pages of 'Readings with Hilger direct reading Spectroscope' dated 24 December 1919 and 4 January 1920, a loose page of notes dated 2 January 1920, and a post card from F.J.M. Stratton to Thomson postmarked November 1919. Internal evidence suggests that the lecture notes at the front of the book belong to the same period (none of them are dated).
- B.33 Hard-cover notebook labelled 'Thomson. form VI', the first entry in which is headed 'Design of Apparatus etc. Dr. Aston. May 1920'. Several pages, presumably containing school exercises, have been torn from the front of the book.
- B.34 Red soft-cover notebook labelled 'Hydrogen Spectrum 1920'. Contains notes on experiments, diagrams of apparatus, tables of results, etc. The first entry is dated 15 January 1920. Entries continue to 19 May. A loose page of notes dated 6 January 1920 is tucked inside the front cover of the book.
- B.35 Brown soft-cover exercise book labelled 'July 1920 - Feb. 1921. Anode Rays'. Contains accounts of experiments with diagrams of apparatus, tables of results, etc. Entries begin on 9 July 1920 and continue almost daily to 1 February 1921 with a break between 1 August and 11 October 1920.
- B.36 Dark blue soft-cover notebook labelled 'Anode Rays II. 1921', and inscribed inside front cover 'G.P. Thomson. Corpus Christi Coll. Feb.-Aug. 1921'. The first entry is dated 3 February and continues on from the last entry in B.35. Entries continue to 9 August 1921.

Early notebooks and research

- B.37 Red soft-cover notebook labelled 'Scattering of positive rays. Electric detection. 1921'. Contains records of experimental work, tables of results, etc. 1 October 1921-23 May 1922.
- B.38 Black soft-cover notebook labelled 'Scattering by electric method. Readings plotted 1922'. Contains diagrams of experimental results, February-May 1922. There are several loose sheets tucked inside the front cover of the book, and some pages, presumably containing school exercises, have been removed from what was originally the front of the book (now the back).
- B.39 'Absorption of positive Rays (Protons)'.  
5 pp. ms. calculations and notes on the literature. n.d.

SECTION C      ELECTRON DIFFRACTION C.1 - C.45

In 1922 Thomson was appointed as Professor of Natural Philosophy in the University of Aberdeen, where he remained until 1930 when he went to succeed H. L. Callendar as Professor of Physics at Imperial College, London. It was at Aberdeen that Thomson did his famous electron diffraction experiments which led to his sharing the Nobel Prize for Physics with C. J. Davisson in 1937. The research notes and notebooks in this Section document much of this work together with his earlier research at Aberdeen on positive rays.

On moving to Imperial College Thomson continued to study electron diffraction and tried to develop it as a technique for the study of surfaces. His experimental work was interrupted by illness at the beginning of 1936 by which time he was already becoming interested in the study of neutrons which had been introduced to Imperial College by P. B. Moon soon after his arrival (see Section D); it was to this study that he returned when he was able to resume work in 1938.

Lectures on electron diffraction are to be found in Sections F and G. See also Section K for slides of electron diffraction experiments.

Electron Diffraction

- C.1 'Test of a Theory of Radiation, 1923'.  
University of Aberdeen Examination Book containing descriptions and diagrams of apparatus, notes of experimental results, 29 January-6 March 1923.
- C.2 'Test of a Theory of Radiation, 1923 (2)'.  
University of Aberdeen Examination Book containing notes on experiments, 19 March-22 May 1923. Two loose sheets of notes and diagrams are also tucked inside the book and have been left in situ.
- C.3-C.8 Contents of a folder labelled 'Potential Drop in Dark Space. October 1923-January 1924'.  
For ease of reference, the material has been subdivided and put into separate folders. Thomson's original ordering of the papers has been retained.
- C.3 Typescript draft of paper by Thomson on 'The Cathode Fall of Potential in a High Voltage Discharge' later published in Proc.R.Soc.Edinb. 44, 129-139. The draft is undated.  
Also included in the folder is a letter from J. J. Thomson, 22 January 1924, containing an account of some experimental results relating to Thomson's research.  
See also Introduction to Section F.
- C.4 Graphs showing experimental results, 25 October 1923-10 January 1924.
- C.5 University of Aberdeen Examination Book containing notes on experimental apparatus and results, 24-30 October 1923. 3 loose pages of graphs (n.d.) are tucked inside the front cover of the book.
- C.6 University of Aberdeen Examination Book containing tables of experimental results 31 October-20 November 1923 (includes some loose pages).
- C.7 Notes on experiments and tables of results, 21 November 1923-14 January 1924.
- C.8 Miscellaneous notes, drafts, calculations and diagrams. These have been left inside the original folder. Includes programme of a meeting of the Royal Society of Edinburgh, 5 May 1924, at which G.P. Thomson's paper on 'The Cathode Fall of Potential in a High-Voltage Discharge' was read.

Electron Diffraction

- C.9 Dark blue soft-cover notebook labelled 'Scattering by photographic method, including argon'. Records of experiments, diagrams of apparatus, tables of results, etc. 28 November 1924-23 April 1926. Many of the entries are in the hand of J.D. McKay (Thomson's laboratory assistant). The book contains a few loose pages of notes which have been left in place.
- C.10-C.22 Contents of folder labelled 'Calculations for Scattering of positive rays in hydrogen, argon and helium'. The order of the papers remains unchanged but the original folder has been discarded.
- C.10 Note by Thomson of the dates between which experiments were performed with various gases (hydrogen, oxygen, helium, argon), January 1925-June 1926.
- 2 letters from the British Photographic Research Association (F.C. Toy), July 1924, re calibrated wedges.
- C.11 University of Aberdeen Examination Book labelled 'Argon and Helium Scattering Results and Calculations'. Contains notes, calculations and summaries of experimental results.
- C.12-C.19 'Calculations for hydrogen scattering. Paper Phil. Mag. May 1926'.
- C.12 Miscellaneous calculations and summaries of results of experiments on scattering of positive rays by hydrogen, 13 March-3 June 1925.
- C.13 Bundle of calculations labelled 'Inverse Square Law'.
- C.14 2 pp. calculations headed 'To find collision relation'.  
Bundle of unlabelled calculations.
- C.15 Bundle of calculations labelled 'Change of Action in Scattering'.
- C.16 Bundle of calculations labelled 'Inverse cube'.
- C.17 Bundle of calculations labelled 'Effect of Two Nuclei in one Molecule'.
- C.18 Bundle of calculations labelled 'Wentzel's Theory'.
- C.19 Bundle of calculations labelled 'Field of force of a Bohr Molecule'.

Electron Diffraction

- C.20 Miscellaneous tables, diagrams, calculations, referring to various gases.
- C.21 Graphs showing results of experiments with hydrogen, January-June 1925.
- C.22 Graphs showing results of experiments with oxygen, helium and argon, June 1925-June 1926.
- C.23 Bundle of ms. notes by Thomson on four papers by Schrödinger on wave mechanics, c.1926.
- C.24 Dark green hard-cover notebook labelled on spine 'McKay's notes April 1926-November 1928 also measurements of some early rings'. Some of the entries are in Thomson's hand.
- McKay was Thomson's laboratory assistant at Aberdeen. He accompanied Thomson on his visit to Cornell in 1929-30 (see C.33) and continued working for him when he moved to Imperial College.
- C.25 Unlabelled dark blue notebook recording experimental results, 19 January-5 February 1927. Not in Thomson's hand.
- C.26 'The Derivation of Quantum Statistics'.
- Spring-back folder containing bundles of ms. notes by Thomson and another. All are undated. The folder also contains a reprint of an article by J.E. Lennard-Jones on 'Some recent developments of statistical mechanics' dated 1928.
- C.27 Black spring-back binder containing records of experimental results. The title page reads 'Diffraction Rings by Metal Films. Measurements September 21 1927-June 1929. G.P. Thomson'. All the entries are in Thomson's hand.
- Tucked into the front of the binder is a letter from E. Rupp, 10 June 1929, re electron diffraction experiments.
- C.28 Bundle of ms. notes with heading added later by Thomson 'Attempt to repeat Rupp Expt (?)'.
- C.29 Blue hard-cover notebook labelled '"E" Curve for Gold April/29'. The heading inside the front cover reads '"F" curve measurements April 1929 G.P. Thomson'. Contains records of experiments on 12, 19, 22 and 29 April with summary of results. 2 loose pages labelled 'Fig.1' and 'Fig.2' have been left tucked inside the rear cover; a bundle of graphs has been removed from inside the front cover and appears as a separate item at C.30.

Electron diffraction

C.30 Set of graphs illustrating results of experiments for 12, 19, 22 and 29 April 1929. These were originally tucked inside the front cover of the notebook at C.29 above.

C.31 Correspondence re electron diffraction experiments from

F. Kirchner	27 December 1929
N.F. Mott	n.d., c.1929
A. Sommerfeld	4 December 1929.

Thomson's replies to these letters have not survived. Folder also includes miscellaneous related diagrams and printed matter.

C.32 Dark green spring-back binder labelled 'Diffraction by Reflection 1929-30 measurements'. Contains records of experimental results, August 1929-May 1930.

C.33 Dark green hard-cover notebook labelled on spine 'McKay's notes November 1928-March 1932'. Not all entries are in McKay's hand. 4 pp. of loose notes on 'Zinc sulphide', November 1932, have been removed to a separate folder.

Includes record of experimental work done during Thomson's visit to Cornell University where he held the Baker non-resident lectureship in Chemistry, October 1929-January 1930.

See F.48-F.55 for lectures given by Thomson in America during this visit.

C.34 4 pp. laboratory notes headed 'Zinc Sulphide', November 1932. These were originally tucked into the back of the notebook at C.33.

C.35 Dark green spring-back binder labelled 'Diffraction by single crystals June 1930-May 1931'. Records of experimental results, calculations, etc. Includes letter (at back of binder) from W. Diack, 29 September 1931.

C.36 Contents of a binder labelled 'Polarization Expt. Sept. 1932-Oct.34'. Notes, calculations and diagrams, including a note re various difficulties encountered in the conduct of the experiment. The original binder has been discarded.

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- C.37 Dark blue hard-cover notebook labelled on front cover 'Prof. Thomson's Laboratory. Record of Double Scattering Expt.' and on spine 'Polarisation 1933-34'.
- The first entry is dated 11 January 1933, and entries continue to the conclusion of the experiment on 16 April 1944. Very little of the material is in Thomson's hand.
- C.38 Brown spring-back binder labelled on spine 'Accelerated Electrons, stainless steel 1934'. Contains records of experiments 19 October 1934-22 January 1935 and September-October 1935 (with 1p. notes for 29 and 30 July headed 'Specimens of Mirrors from Admiralty Research Dept.'). There are also some pages of data and calculations; a letter from T. Scharff, 28 November 1936, re  $\text{Fe}_3\text{O}_4$ ; correspondence with Firth-Vickers Stainless Steels Ltd., November-December 1935; and referees' comments, November 1936, on a paper submitted by Thomson to the Faraday Society (see C.39).
- C.39 'The Protective Film on Stainless Steel'.
- Typescript draft with ms. corrections of paper submitted by Thomson to the Faraday Society, October 1936. The paper does not appear to have been published. See C.38 for records of the research on which the paper was based, and referees' comments on the paper.
- C.40 Envelope labelled 'Calculations on Electron Diffraction (Theoretical)'. Contains bundles of notes and calculations, all undated, some with titles as follows:
- 'Blurred Rings due to slight penetration'
  - 'Refraction'
  - 'Effect of Refraction on the shape of a ring'
  - 'Resolving Power'
  - 'Cube face orientation'
- C.41 Bundles of undated notes and calculations with various titles as follows:
- 'Ring pattern treated as due to Cross Grating'
  - 'So-called Surface lines'
  - 'To find conditions under which two planes of same group of a single crystal can simultaneously give spots'
  - 'Effect of refractive index on inclined film'

Continued

Electron diffraction

- C.41 (Cont'd.) 'Otty's expts. on Thin Films' (notes not in Thomson's hand.  
'Note on the diffraction of electrons by diamonds'.  
Typescript, possibly not by Thomson.
- C.42 Miscellaneous bundles of undated notes, calculations, etc. mainly on various aspects of electron diffraction.
- C.43 2 bundles of undated calculations, one containing letters from L.C. Martin re ultraviolet filters, 1935.  
  
Folder also contains 3 pp. typescript on 'Measurement of Electronic Current in the Beam of an Electron Diffraction Camera', no author or date.
- C.44 3 typescripts by students and colleagues of Thomson, as follows:  
  
'Report upon a method of preparing cadmium iodide films for obtaining diffraction patterns by transmission', by R. Beeching, 20 March 1934.  
  
'Report on the examination of evaporated films of aluminium, chromium and copper', by R. Beeching, n.d.  
  
'The crystal structure of protective films deposited on magnesium and magnesium alloys by the R.A.E. dichromate process', by H.G. Hopkins.
- C.45 Ms. notes and printed matter re electron diffraction, 1955-56.

SECTION D      NUCLEAR PHYSICS AND THE SECOND WORLD WAR    D.1 - D.78

The material is divided into two sections, each with an introductory note.

D.1 - D.28      Nuclear physics and the MAUD Committee

D.29 - D.78      Second World War: other activities

D.1-D.28      NUCLEAR PHYSICS AND THE MAUD COMMITTEE

According to Thomson's autobiography (A.7) his interest in nuclear physics stemmed from the arrival of P.B. Moon at Imperial College in 'about 1932'. Moon introduced the study of neutrons to the laboratory soon after their discovery by Chadwick, and Thomson's early work on this subject is documented at D.1 - D.4; on his return to Imperial College in 1938 after two years of illness he collaborated with Moon in attempts to measure slow-neutron velocity distributions and absorption coefficients (see D.5, D.6).

In the spring of 1939 work on nuclear fission in various parts of the world suggested that the release of an enormous amount of energy from uranium by means of a chain reaction might be a real possibility. Thomson was quick to realise the military implications of this. He asked Air Marshal Sir Wilfred Freeman for a ton of uranium oxide for conducting experiments at Imperial College and proceeded to establish that a chain reaction could not be easily obtained using natural uranium oxide and ordinary water or paraffin.

The work was interrupted when Thomson went to Farnborough on the outbreak of the Second World War (see D.30 - D.34), but his interest in the problem was reawakened in early 1940 by the claim of O. Frisch and R. Peierls that the chain reaction could be obtained by using pure  $U^{235}$ . This led to the formation of the MAUD Committee which had its first meeting in April 1940 (see D.10).

The following papers contain some of Thomson's early research notes on experiments with neutrons and one folder of calculations re uranium (D.8) as well as copies of the MAUD Committee reports of July 1940, various notes of meetings and

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some correspondence, both contemporary and later. Other material on the MAUD Committee is held at Churchill College, Cambridge, where Thomson deposited a small collection of papers at the request of Sir John Cockcroft in 1966.

Permission to consult these should be obtained from The Archivist, Churchill College, Cambridge.

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- D.1-D.9      Neutron research at Imperial College, 1934-40.
- D.1          Folder labelled 'Deuton Bombardment Expt. Oct./34 - March/35'.  
  
              Contains account of experiment and notes on results. A letter from M.L. Oliphant, 9 March 1934, re proton yield from the bombardment of heavy hydrogen with heavy hydrogen is tucked into the back of the folder.
- D.2          2 bundles of notes on experiments with neutron source. Both are undated but one includes a letter from S. Russ, 20 November 1934, re possible supply of radon sources.
- D.3          Note pad containing records in various hands of experiments with electron counters, 3 May-3 June 1935. These experiments are continued in the notebook at D.4 below.
- D.4          Dark blue hard-cover notebook labelled on front cover 'Experiments with Electron Counters. Prof. Thomson's Laboratory. 1935', and on spine '1935 Positrons'. Entries run from 4 June to 10 October 1935; none of the material is in Thomson's hand. A few loose pages remain inside the front cover of the book.
- D.5          Notes on experiments 13 January-10 February 1938. Not all in Thomson's hand.
- D.6          Red spring-back binder containing ms. and typescript records of neutron velocity analyses, 20 September 1938-July 1939, conducted by various members of Thomson's laboratory.
- D.7          Folder labelled 'Letters to Nature on Uranium and Thorium'. Contains extracts from issues of Nature, 11 February-20 May 1939 and ms. notes (not in Thomson's hand) on current literature relating to uranium fission, June 1939.
- D.8          Folder labelled 'Uranium Calculations', containing miscellaneous bundles of calculations, mainly in Thomson's hand. None are dated, but some relate to a letter from Thomson to R. Peierls, 13 August 1940, a copy of which is included in the folder. Also included is a letter from J.L. Michiels, 12 January 1940.  
  
              A later note by Thomson on the front of the folder reads 'Most of my papers on this subject are at Churchill College' [Cambridge]. Churchill College holds one box of papers relating to the MAUD Committee which Thomson deposited at the request of Sir John Cockcroft in 1966. Permission to consult these should be obtained from The Archivist, Churchill College, Cambridge.
- D.9          Folder containing set of calculations headed 'Bomb in potentially explosive medium'. n.d.

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- D.10-D.28    Papers relating to the MAUD Committee
- D.10        2 separate pages of ms. notes, made at different times, summarising activities relating to the work of the MAUD Committee:
- a)        10 April 1940 (first meeting) - 29 September 1941.
- b)        18 September 1941-8 June 1942 (also mentions purchase of uranium, 9 December [1939?]).
- D.11        'Report by M.A.U.D. Committee on the use of Uranium for a Bomb'. 13 pp. typescript with 2 Appendices, July 1941.
- D.12        'Report by M.A.U.D. Committee on the use of Uranium as a source of power'. 4 pp. typescript, July 1941.
- D.13        Various research papers (not by Thomson) as follows:
- 'Evidence for a potentially divergent nuclear reaction chain in a system, below the critical size, containing U and D'. Typescript by H. Halban and L. Kowarski. n.d., c.1941.
- 'Some notes on the Halifax Explosion', by H. L. Bronson (reprint).
- 'Preliminary report on work carried out in Liverpool'. Typescript, no author or date.
- 'Ellis' experiments on the abs. levels of Ur.'. Typescript by C.D. Ellis, 26 January 1940, with ms. title added later by Thomson.
- 'Uranium bomb'. Typescript, no author or date. Discusses possibility of a uranium bomb.
- 'Splitting of the uranium nucleus'. Duplicated typescript, no author or date. c.1940.
- D.14        Report on 'Meeting Section S.I. Bureau of Standards, Washington, 16 January 1942'. 10 pp. typescript.
- D.15        'Notice of Meeting of S.I. held at Bureau of Standards, Washington, February 13 1942'. 8 pp. typescript.
- D.16        Ms. and typescript versions of report by Thomson on 'Meeting at Offices of C.O. Jelliff Corporation, June 19, 1942'.

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- D.17 Correspondence with E. V. Appleton, D.R. Pye and H.T. Tizard, October 1941-April 1942.
- D.18-D.26 Correspondence with historians and colleagues re the MAUD Committee, 1952-61.  
In alphabetical order.
- D.18 Butler, J. R. M. Feb. 1955
- D.19 Chadwick, J. Aug. 1952  
enclosing copy of the MAUD Report (see D.11)
- D.20 Clark, R. W. Oct. 1959-Dec. 1960  
Correspondence in connection with his book 'The Birth of the Bomb'. After answering various queries, Thomson was asked to write a preface to it. See F.207 for Thomson's typescript draft.
- D.21 Cockcroft, J. Feb. 1960  
re telegram sent by Niels Bohr which led to the naming of the MAUD Committee.
- D.22 Gowing, M. M. April-May 1961  
Correspondence in connection with her book 'Britain and Atomic Energy'. Includes copies of contemporary documents sent to Thomson for information.
- D.23 Le Bourdais, D. M. Oct.-Nov. 1958  
re naming of the MAUD Committee. Includes a letter from O.R. Frisch, 3 November 1958.
- D.24 Pickthorn, K. Jan. 1959  
re uranium. Includes a letter from H.L. Ismay, 8 January 1959.
- D.25 Tizard, H. T. Aug.-Oct. 1957
- D.26 Wheeler-Bennett, J. March 1960  
Correspondence in connection with his biography of Viscount Waverley.
- D.27 1 p. ms. notes on nuclear fission. This was found tucked inside the folder at D.72.
- D.28 Miscellaneous newspaper cuttings assembled by Thomson re the dropping of the atomic bomb on Japan, 1945.  
Folder also includes a set of typescript notes on 'Delayed Neutrons resulting from fission' reviewing current state of research immediately after Second World War.

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D.29-D.78      SECOND WORLD WAR: OTHER ACTIVITIES

At the beginning of the Second World War Thomson went to work at the Royal Aircraft Establishment, Farnborough. His wife, Kathleen, and their four children were sent to America for safety during the threat of invasion in the summer of 1940, but in 1941 Kathleen became gravely ill and at his own request Thomson was transferred to Ottawa as Scientific Liaison Officer in order to be nearer to her. She died at the end of 1941 but Thomson continued to work in Canada for a further six months, returning to England in the summer of 1942. He then spent a year as Deputy Chairman of the Radio Board and a further year as Scientific Adviser to the Air Ministry, returning to take up his duties at Imperial College at the end of 1944.

The documentation for this period is sparse. There is very little in the way of correspondence, and less to illustrate Thomson's daily activities, with the exception of the visits he made to various establishments in Canada and the U.S.A. for which a series of ms. and typescript reports is to be found at D.35 - D.59.

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D.29

Aeronautical Research Committee

Letter of 3 June 1937 inviting Thomson to serve on the Main Committee for 3 years until 31 March 1940.

Letters of 14 October 1942 accepting Thomson's resignation from the Stability and Control and Aerodynamics Sub-Committees and assuming his resignation from the Fleet Air Arm Research Sub-Committee and the High Altitude Sub-Committee.

Folder also includes a copy of a report (not by Thomson) submitted to the Committee, January 1938.

D.30-D.34

Royal Aircraft Establishment, Farnborough

Thomson went to Farnborough the day before war was declared. Initially he was attached to the Armaments Department and his work included research into the possibility of sweeping magnetic mines from the air (see D.31, D.33). Later he was transferred to the Aerodynamics Department.

The few surviving papers for this period represent only a very small part of Thomson's work during the first two years of the war.

D.30

Letter from H.E. Wimperis, 9 June 1939, enquiring whether Thomson would be willing to 'take part in the research activities of Air Ministry Research Establishments in time of war'. Thomson's reply (affirmative) is also included in the folder.

D.31

H.M. Stationery Office notebook labelled 'Magnetic Mines 1939', containing diagrams, calculations, notes of results of tests, etc. These run from both the front and the back of the book. 1 p. notes and 2 letters re mine sweeping by aeroplanes are tucked into the front of the book.

D.32

Ms. and typescript drafts of 'Note on the limits of blackness for small surfaces'. n.d.

D.33

Folder containing bundles of calculations, all undated, some with titles as follows:

'Hopkinson bar'

'Pressure on ground due to passage of an aeroplane 300' overhead' (not in Thomson's hand).

'Suggestion for making a channel safe from magnetic mines'

'Torpedo Bombsight'

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D.34

Copy of memorandum sent to F.A. Lindemann (later Lord Cherwell), 20 September 1940, headed 'Suggestion for a simple predictor for use with U.P. on ships', with accompanying letter.

3 pp. of calculations, which were not sent to Lindemann, are also included in the folder.

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D.35-D.65 Canada, September 1941-July 1942

After 2 years at Farnborough, Thomson went to Ottawa as Scientific Liaison Officer between Britain and Canada. Most of the following papers are accounts of meetings and visits in Canada and U.S.A. but there is also some correspondence.

See also D.14-D.16 for meetings in Washington and elsewhere relating to the MAUD Committee.

- D.35 'Television Glider. Notes of meeting with Dr. H.L. Dryden, Bureau of Standards'. 30 Sept. 1941  
3 pp. ms.  
  
A report by G.S. Levy and W.F. Campbell on 'Visit to N.A.C.A. Langley Field, and the Bureau of Standards, Washington', presumably sent to Thomson for information, is also included in the folder.
- D.36 'Notes on visit to Toronto'. 9, 10 Oct. 1941  
2 pp. typescript.
- D.37 'Notes on visits to Kingston and Montreal'. 18, 20 Oct. 1941  
3 pp. typescript.
- D.38 'Notes of meeting with Dr. Dellinger'. 23 Oct. 1941  
2 pp. ms.
- D.39 'Notes on meeting of Microwave Committee held at Carnegie Institute, Washington'. 24 Oct. 1941  
3 pp. duplicated typescript.
- D.40 'Visit to Bell Telephone Laboratory, New York'. 4 Nov. 1941  
2 pp. duplicated typescript.
- D.41 'Notes of meeting with Col. Patterson and Mr. Musson'. 8 Nov. 1941  
2 pp. ms.

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- D.42 'Report of visit to Dr. Henderson and Dr. Johnstone at Halifax'. 1, 2 Dec. 1941  
2 pp. typescript.
- D.43 'Report on a visit to Watertown Arsenal by Dr. Darwin and Dr. Thomson'. 4 Dec. 1941  
1 p. typescript.
- D.44 'Notes on an interview with Air Vice-Marshal McKean'. 13 Jan. 1942  
1 p. typescript.
- D.45 'Notes on meeting with Group Captain Crabbe, Jackson Building, Ottawa'. 13 Jan. 1942  
1 p. typescript.
- D.46 'Notes on interview with Colonel H.E. Taber'. 13 Jan. 1942  
1 p. typescript.
- D.47 'Notes of visit to University of Western Ontario, London, Ontario'. 24 Jan. 1942  
2 pp. typescript + 2nd page of another draft of the notes.
- D.48 2 sets typescript notes on radar equipment headed 'Army Group' (1 p.) and 'Radio Branch' (2 pp.), presumably relating to a visit or meeting. The second set is dated 26 March 1942. (Mar. 1942)
- D.49 'Report of visit to Wright Field, May 8th accompanied by B.S. Shenstone of the British Air Commission'. 8 May 1942  
4 pp. duplicated typescript.
- D.50 'Meeting Boyle, McKenzie, Burton, Pitt, Pressey, Rose, Field, to discuss Pitt's Asdic'. 15 May 1942  
2 pp. ms.
- D.51 'Visit to Universities at Winnipeg, Saskatoon, Edmonton, Vancouver and the Observatory at Victoria'. 18-26 May 1942  
5 pp. typescript

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- D.52 'Work on heat transfer by Dr. Boelter and group at Berkeley University'. 28 May 1942  
2 pp. typescript.
- D.53 'Report of discussions with Von Karman and Clark Millikan at California Institute of Technology'. 29 May-2 June 1942  
2 pp. typescript.
- D.54-D.56 3 undated reports on work at California Institute of Technology, possibly relating to the same visit.
- D.54 'Rocket projects at California Institute of Technology'. n.d.  
2 pp. typescript.
- D.55 'Report on work in connection with A.S. rocket-propelled projectiles at California Institute of Technology'. n.d.  
2 pp. typescript.
- D.56 'Rockets for take off at California Institute of Technology'. n.d.  
2 pp. typescript.
- D.57 'Report of visit to Moffett Field'. 5 June 1942  
2 pp. typescript.
- D.58 'Visit to McGill'. 20 July 1942  
2 pp. typescript.
- D.59 'Notes on meeting at Toronto with Dr. Best and Dr. Solandt, Professor Shenstone and myself present'. n.d.  
3 pp. typescript.
- D.60 Bundle of notes relating to various visits and meetings. None of the material is dated with the exception of the first page which is headed 'Parkins Lab. June 25 [1942] with Egerton'.
- D.61 2 pp. ms. notes on de-icing of aircraft, n.d.
- D.62 Small black notebook used by Thomson while he was in Canada. Contents mainly scientific with some personal material. Includes notes taken during some of the visits described in D.35-D.59.

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D.63 'Memorandum on Scientific Liaison'. n.d.  
2 pp. typescript.

D.64 Miscellaneous undated notes made in Canada.

D.65 Correspondence November 1941-June 1942.

The letters are in chronological order and consist mainly of Thomson's carbons, but all incoming letters have been indexed.

See also D.17.

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- D.66-D.72      Radio Board. September 1942-November 1943
- D.66      Correspondence September-October 1942. Includes letters of appointment as Deputy Chairman of the Radio Board and arrangements re salary, etc.
- D.67      'Radio Board. Meeting to be held on 18 March 1943. Additional note for the Chairman'.  
  
1 p. typescript suggesting that Thomson should become Scientific Adviser to the Chairman.
- D.68      Correspondence March-November 1943.  
  
Thomson resigned from the Radio Board at the end of October 1943 following his appointment as Scientific Adviser to the Air Ministry.
- D.69      Booklet on 'R.D.F. Principles and Circuits', issued by the Air Ministry, October 1942.  
  
1 p. ms. note by Thomson re assymetrical telescope is clipped inside front cover.
- D.70      'R.D.F. Principles and Circuits. Chapter 9 - Centimetre Waves'. Sequel to D.69, issued by Air Ministry December 1942.
- D.71      Small black ring-binder containing a typescript survey of British Radar Systems currently in use or under development, April 1943, with a summary of projects under discussion by the Radio Board. A label at the front of the binder reads 'Property of Professor G.P. Thomson, Deputy Chairman, Radio Board. With the compliments of London Mission, O.S.R.D.' [the producers of the survey].  
  
At the back of the binder are 4 pp. ms. notes by Thomson on radar.
- D.72      Folder containing copies of 'Material for the United States Special Mission on Radar', prepared by the London Mission, O.S.R.D., April 1943.  
  
1 p. ms. notes on nuclear fission, which was found inside the folder, has been transferred to D.27.

Nuclear physics and the Second World War

- D.73-D.76      Scientific Adviser to the Air Ministry, November 1943-December 1944
- D.73            Correspondence October-November 1943.  
Includes an exchange with the Secretary of State for Air (Sir Archibald Sinclair, later Lord Thurso) re conditions of Thomson's appointment.
- D.74            Copy of memorandum from Sir Robert Watson-Watt to the Secretary of State, 3 July 1944.
- D.75            Brief administrative correspondence October-November 1944 apparently re a visit to Belgium which is mentioned in Thomson's autobiography (see A.7 ): he was asked to visit some of the operational research units attached to the Tactical Air Force in Belgium.  
  
Folder also contains a typescript list of staff at No.100 Group, East Dereham, Norfolk.
- D.76            Brief correspondence November-December 1944.  
Includes Thomson's letter of resignation in order to return to Imperial College, and a request that he should continue to represent the Air Ministry on the Joint Technical Warfare Committee, pending the appointment of a successor.

Nuclear physics and the Second World War

D.77

R.D.F. Application Committee

Letter from E. V. Appleton, 3 January 1945, inviting Thomson to serve on the Committee.

D.78

Ministry of Supply. Advisory Council on Scientific Research and Technical Development

Correspondence re Thomson's resignation from the Council, September-October 1945.

Copy of 'Report on a tour in Germany by Lt. General J.F. Evetts', presumably sent to Thomson for information.

Receipts for Advisory Council reports returned by Thomson, March and October 1945.

SECTION E      THERMONUCLEAR RESEARCH E.1 - E.145

The material is divided as follows:

- |              |   |
|--------------|---|
| E.1 - E.70   | Notes, drafts and calculations, 1946-59                       |
| E.71 - E.87  | Patent applications relating to thermonuclear energy, 1946-59 |
| E.88 - E.90  | Correspondence and papers, 1946-52                            |
| E.91 - E.105 | Minutes of meetings, 1952-63                                  |
| E.106-E.111  | Correspondence, 1958-63                                       |
| E.112-E.143  | Research reports and lectures by others                       |
| E.144, E.145 | Miscellaneous other material                                  |

### Thermonuclear research

'By the beginning of 1946,' wrote Thomson in his autobiography (A.9) 'my own interest was turning to the possibility of the controlled emission of nuclear power from the (relatively) heavy isotopes of hydrogen; what is now called thermonuclear energy.'

The initial work was done at Imperial College in collaboration with M. Blackman with whom Thomson filed a provisional patent for 'Improvements in or relating to high temperature systems' in 1946 (see E.75). By 1947 considerable progress had been made in theoretical and small-scale experimental research, and Thomson felt ready to initiate a full-scale project, requiring more extensive facilities than Imperial College could provide. Related research was already in progress at the Atomic Energy Research Establishment (A.E.R.E.), Harwell, so Thomson approached T.E. Allibone, Director of the newly-established Research Laboratory of Associated Electrical Industries Limited (A.E.I.) at Aldermaston. Some aspects of the ensuing negotiations are documented in E.88 - E.90; the Imperial College group finally moved to Aldermaston in 1951 and a programme of research was started which led to the production of the apparatus known as Sceptre III in autumn 1957. The Aldermaston group worked in close cooperation with Harwell throughout its existence; several minutes of progress meetings, at which Thomson was also in regular attendance, are to be found at E.91 - E.105.

Most of the thermonuclear work ceased to be secret after the simultaneous publication in January 1958 of accounts of the work with Sceptre III and Zeta, a similar apparatus produced by Harwell. Thomson subsequently became less directly involved with thermonuclear research and his active participation finally ceased in 1963 when A.E.I. decided to close down the Aldermaston Laboratory.

The survival of Thomson's research notes and drafts for this period (E.1 - E.70) is particularly interesting in view of the secrecy restrictions which allowed him to publish so little (but see F.114, F.115), although some of his drafts were reproduced for limited circulation as Harwell research reports (see, e.g., E.34, E.35).

See F.150 - F.209 for further material on thermonuclear energy.

Thermonuclear research

- E.10 Duplicated typescript 'Note on the Torus Project', n.d., but with ms. annotation by Thomson 'Sent to Bunneman Feb. 27 1948'.  
See also Thomson's ms. note at E.88.
- E.11 Duplicated typescript on 'Effect of charge-exchange from gas molecules entering the torus', 3 June 1949.
- E.12-E.14 Contents of a folder labelled '"Thermo-Nuclear Reactions". Jan. 1950 (in this form).'
- E.12 45 pp. typescript headed 'Thermonuclear Reactions', January 1950. This is contained in the original folder.
- E.13 Various appendices to the typescript, as follows:  
  
    'Symbols used in "Thermonuclear Reactions"'. Ms. and typescript versions.  
  
    'Accumulation of Waste Products'. 5 pp. typescript with 3 figures. See also E.15.  
  
    'Drift of Electrons'. 2 pp. typescript.
- E.14 Bundles of later ms. notes and calculations, some with titles as follows:  
  
    'Calculation of time taken for electron to be forced to wall of torus'. 1 p. ms.  
  
    'Bennet relation applied to "Thermonuclear Reactions" 1950 and criticism of energy demand.' 2 pp. ms.  
  
    '"Thermonuclear reactions". Method of calculating the work to support the current.' 2 pp. ms.
- E.15 Spare copy of 'Thermonuclear Reactions'. Carbon of typescript with appendix on 'Accumulation of Waste Products'. The folder in which it is contained has a note on the front cover 'This was the first complete statement of my elementary theory but most of the points were studied separately in the course of 1946-49. G.P.T. 1966'.
- E.16 16 pp. typescript on '"Wirbelrohr" Oscillations'. According to a ms. note by Thomson elsewhere in the collection (E.88) this paper was submitted for publication in Proc.Phys.Soc. in July 1950. It was accepted in October 1950, but permission to publish was withdrawn, and it was eventually circulated as a stencilled research report by Harwell, January 1951.  
  
Folder includes brief letter from the Ministry of Supply, June 1951.  
  
See also E.17.

Thermonuclear research

- E.17 Folder labelled 'Wirbelrohr Calculations'. Bundles of undated ms. notes and calculations (not all in Thomson's hand), some with headings as follows:
- 'Sudden breakdown of toroid'
  - 'Betatron condition with large currents'
  - 'The input of power to a secondary circuit whose resistance suddenly breaks down'
  - 'The effect of an iron-core in prolonging the discharge'
  - 'Velocity of electrons'
  - 'Magnet design'
  - 'Current as betatron'
- See also E.16.
- E.18 Folder labelled '4th Report. Air Cored Betatron work at Imperial College. December 1950'. Contains:
- Typescript of the report, by R. Latham and M.J. Pentz.
  - Duplicated typescript version, circulated as A.E.R.E. Harwell report no. XM/68 under the title 'High currents in gaseous discharges', December 1950.
  - Various background notes.
  - 2 pp. ms. 'First Report on Air-Cored Betatron', 21 September 1949.
- E.19 Spring-back binder containing 'Papers relating to work with Hemming on excitation of gas discharge by synchrotron action with travelling wave. 1951'. Ms. notes, diagrams and drafts, not all in Thomson's hand.
- E.20 'Estimate of neutron yield from torus under threshold conditions'. 6 pp. typescript with ms. annotations, June 1951. 2 copies.
- See also E.21.
- E.21 Spring-back binder containing 'Calculations for yield of Tori of different sizes'. Some of these are related to Thomson's paper 'Estimate of neutron yield from torus under threshold conditions' (see E.20) copies of which (ms. and typescript drafts) are included in the binder. There is also a letter from A.A.Ware, 12 March 1952.

Thermonuclear research

- E.22-E.28 Contents of folder labelled 'General theory of torus with  $w$  constant. Ms. Part I, II, III'. The original folder has been preserved at E.28.
- See also E.29.
- E.22 'Theory of Torus with concentrated discharge assuming constant "tyrewise" velocity. Part I'.  
Undated ms. draft.
- E.23 Photocopy of typescript of E.22, dated November 1951. This was not part of the original contents of the folder.
- E.24 'Theory of Torus assuming constant "tyrewise" velocity. Part II'.  
Undated ms. draft.
- E.25 2 copies (not identical) of typescript version of E.24, dated November 1950.
- E.26 'III. Power required to run a discharge in a Torus'.  
Undated ms. draft.
- E.27 Typescript of E.26, dated January 1952.
- E.28 3 sets of background notes and a graph. These have been left in the original folder. The notes are headed as follows:  
  
'Fundamental formulae assuming  $w$  is constant'  
'Appendix: Equation of transfer in cylindrical polars with circular symmetry'  
'Derivation of "z" equation of transfer in cylindrical coords.'
- E.29 17 pp. ms. calculations, headed 'General Theory with constant tyrewise velocity  $w$ '.  
  
See also E.22-E.28.
- E.30 Folder labelled 'Thermonuclear Work. Folder 1. Professor Thomson's papers', containing a set of 'Mathematical Appendices' in Thomson's hand. It is not clear exactly when these were written or why, but they all relate to the theory of thermonuclear reactions.

Thermonuclear research

- E.31 Conference on 'The Physics of Ionized Gases' held at University College, London, 23-25 March 1953. Folder contains programme of the conference, 1 p. ms. notes, probably for Thomson's Opening Remarks, and several pages of notes on papers delivered.
- E.32 2 typescript drafts (not identical) of paper on 'The Pinch Discharge in a Wholly Ionised Gas'. Both are undated, but one is annotated 'Corrected Copy October 1963'.
- E.33 'Addendum to "Pinch Discharge in a Wholly Ionised Gas"'. 3 pp. ms.
- E.34 Duplicated typescript of E.32 with ms. annotations, circulated as A.E.R.E. Harwell report X/M 119, October 1953. Folder includes 4 pp. ms. calculations which were tucked inside the back cover of the report.
- E.35 Undated ms. draft of paper on 'Pinch Discharge in a Partially Ionised Gas'.
- E.36 Correspondence with A.A. Ware, November-December 1953, with re-draft of part of E.35.
- E.37 Typescript draft of E.35 with ms. corrections, December 1953.
- E.38 Duplicated typescript of E.35, with ms. annotations, circulated as A.E.R.E. Harwell report X/M 122, 17 December 1953. Folder also includes a carbon copy of the final typescript.
- E.39 Folder labelled 'Miscellaneous Calculations and Results', containing several bundles of papers all undated. One of these includes a letter from W.B. Thompson, 23 April 1954.
- E.40 Undated ms. draft headed 'Loss of particles to the walls in presence of crossed electric and magnetic fields'.
- E.41-E.44 Contents of folder labelled 'Miscellaneous calculations. Torus'. Mainly ms. notes and drafts, some with headings, but all undated. Thomson's ordering of the papers has been retained, but they have been split up into smaller units, for ease of reference. The original folder is at E.41.
- E.41 'Estimate of power required for a pinch'. 4 pp. typescript. (See also E.45.)  
'Pinch in a highly ionised gas discharge'. 6 pp. ms.  
1 p. ms. notes on work by others in the same field.

Thermonuclear research

- E.42 'Power required to run discharge (with nuclear reaction)'  
4 pp. ms.  
'Conductivity of ionised gas and rate of heating'.  
1 p. ms.  
2 pp. calculations.  
'Power consumption'. 8 pp. ms.
- E.43 'Momentum and mass transfer in a gas of variable density'.  
2 pp. ms.  
'Transfer of energy from electrons to nuclei'. 3 pp. ms.  
'Electron acted on by wave while in crossed electric &  
magnetic fields'. 3 pp. ms. (not all in Thomson's hand).  
8 pp. calculations.
- E.44 'Loss of energy due to charge exchange during ionisation  
stage'. 6 pp. ms.  
'Time constant for variations in V and T'. 1 p. ms.  
Miscellaneous calculations.  
Two copies (one annotated) of 1 p. typescript on 'Recombination  
of electrons and protons'.
- E.45 'Estimate of power required for a pinch'. 4 pp. typescript, n.d.  
There is another copy of this at E.41.
- E.46 'Note on Highly Ionised Discharge'. 4 pp. typescript, n.d.
- E.47 'Power loss in discharge'. 7 pp. ms. draft, n.d.
- E.48 Ms. and typescript versions of a second draft of E.47, both  
undated.
- E.49 'Detailed calculations for paper on the plasma shock waves'.  
Ms. notes paginated from 10 - 18, n.d.
- E.50-E.60 Miscellaneous undated notebooks.
- Most of these contain notes or calculations re thermonuclear  
work interspersed with other material such as notes for lectures  
or publications, notes on articles, personal jottings, etc. Some  
of this material probably spans a number of years. A few of the  
notebooks have had most of their pages torn out (see E.56, E.57).
- E.50 Soft-cover notebook containing calculations re thermonuclear  
work interleaved with some personal and autobiographical notes.

Thermonuclear research

- E.51 Spiral bound notebook containing calculations re thermonuclear work, notes on articles, personal jottings, etc.
- E.52 Spiral bound notebook containing calculations re thermonuclear work and a few miscellaneous notes.
- E.53 Spiral bound notebook containing calculations re thermonuclear work including Zeta and Sceptre, notes and drafts for lectures and publications, miscellaneous jottings, etc.
- E.54 Spiral bound notebook with rather miscellaneous contents including draft for a speech on the site of the proposed Cambridge University Club, c.1959, notes and calculations re Zeta and Sceptre, and miscellaneous shorter personal notes.
- E.55 Spiral bound notebook containing miscellaneous calculations, notes for lectures, personal jottings, etc.
- E.56 Spiral bound notebook with only 3 remaining pages containing mathematical calculations and miscellaneous notes.
- E.57 Spiral bound notebook with only one remaining page, containing a calculation. A loose sheet of calculations in another hand is tucked inside the cover.
- E.58 Blue notebook with some pages missing containing miscellaneous calculations, mainly re thermonuclear work.
- E.59 Red notebook containing miscellaneous notes and calculations re thermonuclear work, starting from both ends of the book.
- E.60 Hard-cover notebook originally used by Thomson at school, but mainly containing notes on various aspects of thermonuclear research. One end of the book begins with school notes on Trigonometry, and includes Thomson's school time table for the summer term, 1909, and some loose pages of chemistry notes. These are followed by much later notes and calculations, which take up most of the rest of the book, starting from both ends, and occasionally interleaved with other material.
- E.61 Miscellaneous bundles of undated calculations re thermonuclear work. Includes 2 sets on Langevin Mobility.
- E.62 'Conditions for the Neutral Atom in a Pinched Discharge to be confined to a sheathe'. 12 pp. typescript draft with ms. corrections, n.d. (but see E.63).
- E.63 Duplicated typescript version of E.62 circulated as A.E.R.E. Harwell report X/R 1831, January 1956.

Thermonuclear research

- E.64, E.65 Contents of envelope labelled 'Calculations for D-D and D-T reactions and "Energy Balance" 1956. Also rate of accumulation of helium'. The material has been separated into 2 folders for ease of reference.
- See also E.66.
- E.64 Several bundles of calculations. These have been left in the original envelope. Included among them is a letter from J. Moffatt, 14 September 1950.
- E.65 Programme of a one-day conference on 'The production of controlled thermonuclear energy', Harwell, 4 June 1956, with 1 p. ms. notes taken during the conference. Thomson gave a lecture entitled 'The nuclear physics of the problem' and the folder includes correspondence with J.D. Lawson, May 1956, re subject matter to be covered, slides, comparison of data, etc.
- E.66 6 pp. typescript, with ms. additions, on 'Energy Balance', June 1956.
- See also E.64, E.65.
- E.67 Conference on 'Controlled Thermonuclear Reactions', held at Berkeley, California, 20-23 February 1957.
- Spiral bound notebook containing ms. notes taken by Thomson during the conference. A programme of the conference is tucked into the front of the notebook and there are some loose pages of notes tucked inside the back cover.
- E.68 'On the radial electric field necessary for containment in a "pinch" discharge'.
- Ms. and typescript versions (not identical). The typescript is dated 31 December 1957.
- E.69 2 ms. drafts, labelled A and B, both dated 31 January 1958 and headed as follows:
- (A) Motion of charged particles in electric and magnetic fields of cylindrical symmetry, and its effect on an axial current already existing.
  - (B) Effect of nuclear reaction on a circuit outside the torus.
- E.70 3 pp. typescript with ms. additions on 'The Use of Alpha Rays as Probes', 22 June 1959.

Thermonuclear research

E.71-E.87 Patent applications relating to thermonuclear energy, 1946-59

E.71 2 pp. typescript containing preliminary specification with drawings and calculations for toroidal wave guide, no title or date, c.1946. The first sentence reads 'It is assumed that a state of an ionized gas, (deuterium), has been set up in which the gas is enclosed in a toroid, the electrons have mean energies of the order of 100,000 e.v. and a certain drift velocity round the toroid'.

Included with the typescript is 1 p. ms. headed 'Proposed Experimental Model' containing a brief description of the toroid, n.d.

E.72 'Method of using the nuclear energy of the D-D reaction'. Ms. and typescript versions, 2 pp. each, n.d., c.1946.

E.73 5 pp. typescript, no author or date, describing the mode of action of the toroid.

E.74 Draft provisional patent specification for 'Improvements in or relating to high temperature systems' by G.P. Thomson and M. Blackman. 9 pp. typescript with ms. annotations. A note on the last page reads 'Based wholly on information collected from Sir George Thomson at meeting of 26 March 1946. B.H. Russell 30.3.46'. See E.88 for an account of the meeting, held at Imperial College.

A second copy, annotated in another hand, is also included in the folder.

E.75 Provisional specification for U.K. patent application No. 13963/46 by Thomson and Blackman for 'Improvements in or relating to high temperature systems', filed 8 May 1946. 9 pp. typescript.

Folder includes brief related correspondence with the Ministry of Supply and the Patent Office and 2 additional copies of the provisional specification.

E.76 Complete specification for U.K. patent application No. 13963/46 by Thomson and Blackman for 'Improvements in or relating to high temperature systems', filed 28 April 1947. 19 pp. duplicated typescript with 4 figures.

A second copy (not quite identical) is also included in the folder.

This specification was not published until 1959 (see E.85).

Thermonuclear research

- E.77 Correspondence with Ministry of Supply re U.S. patent application, 1947-49.
- Folder includes copy of U.S. specification as filed, 28 April 1947, with notes of subsequent amendments, 1948-51. The application was abandoned, March 1953.
- E.78 Correspondence May-December 1951 re U.K. and U.S. patent applications. Includes drafts of amendments, July and October 1951.
- E.79 Correspondence January 1952. Includes provisional specification for U.K. patent application No. 1034/52 by Thomson and Blackman for 'Improvements in or relating to High Temperature Systems', filed 14 January 1952.
- E.80 3 copies of complete specification for patent application for 'Improvements in or relating to High Temperature Systems', filed in U.K. and U.S. 14 January 1953.
- This was not published until 1959 (see E.85).
- E.81 Correspondence December 1952-May 1954, mainly re U.S. patent applications.
- E.82 Correspondence May 1955-January 1956 re U.S. and U.K. patents. Includes minutes of a meeting held at Imperial College, 19 May 1955, to discuss the thermonuclear reactor patent position in Britain and America.
- E.83 2 copies of specification for U.S. patent. One is annotated '1956. Pencil alterations show changes made for 1957 version'; the other is headed '1957 version'.
- Folder also includes copy of declaration re assignment of patent, November 1956.
- E.84 Correspondence August 1957-September 1958 re U.K. and U.S. patents.
- E.85 Correspondence March-November 1959 re patent applications No. 13963/46 and 1034/52. Includes copies of complete specifications as published in August and October 1959 after the relaxation of secrecy restrictions.

Thermonuclear research

- E.86 Spring-back binder labelled 'Papers on Patent for Extraction of Power'.
- Contains correspondence, 1958-62, with provisional and complete specifications for patent No. 15034/58 filed by Thomson on 9 May 1959 (provisional specification filed May 1958).
- A copy of the complete specification as published, 26 April 1962, is also included in the folder.
- E.87 Contents of folder labelled '1958. MS relating to extraction of power'. The original folder has been discarded.
- Ms. and typescript drafts on 'Proposed method of deriving electrical energy directly from a thermonuclear reaction of the "pinch" type', with brief related correspondence, April 1959.

Thermonuclear research

E.88-E.90

Correspondence and papers, 1946-52.

E.88

Notes of various meetings, 1946-49. Folder includes:

'Memorandum of Interview at Imperial College, 26 March 1946'. 1 p. typescript with brief covering letter to Thomson.

'Agenda for Meeting on Thermo-Nuclear Reactions on Jan. 15th, 1947'. 1 p. typescript.

'Note of a discussion on Tuesday, July 13, 1948, at Shell Mex House, in connection with the assignment of patent rights in Sir George Thomson's invention'.  
1 p. typescript (2 copies) with covering letter from Sir John Cockcroft.

2 pp. ms. notes on various meetings and discussions, 1947-49, made by Thomson at a later date.

E.89

Correspondence 1947-51. Includes:

Copy of letter from Thomson to Lord Portal, 29 May 1947, suggesting that A.E.I. should be invited to take over the full-scale development of Thomson's thermonuclear research project.

2 letters from Cockcroft, 29 December 1947 and 13 January 1948, re arrangements for thermonuclear research work.

Letter from O. Bunemann, 6 February 1948.

Correspondence with Ministry of Supply, 1948 re assignment of rights in Thomson's joint patent application with M. Blackman (see E.71 ff.).

Letters from P.C. Thonemann (31 March 1950) and Lord Cherwell (8 May 1950) arranging meetings to discuss thermonuclear research.

Letter from Thomson to Cockcroft, 8 November 1950, renewing proposal to transfer the thermonuclear project at Imperial College to A.E.I.'s Research Laboratory at Aldermaston.

E.90

Spring-back binder labelled 'Aldermaston Contract. Secret letters 1951-52'. Contains correspondence with A.A. Ware, T.E. Allibone and D. Fry (Thomson's carbons only), and a copy of the first three monthly reports on 'Gaseous Discharges Research at A.E.I. Research Laboratory', 16 August-16 November 1951.



Thermonuclear research

- E.96 Meeting No.20, 20 March 1957.  
Minutes.  
Meeting No.21, 7 November 1957.  
Notice of meeting (with Thomson's ms. notes on verso),  
Minutes.
- E.97 Meeting No.22, 14 January 1958.  
Minutes.  
2 pp. typescript re 'A.E.I. Programme', 28 January 1958.  
4 pp. ms. notes re Sceptre 3 and Sceptre 4, n.d. 1958.  
Meeting No.23, 7 August 1958.  
Notice of meeting (with Thomson's ms. notes on verso),  
Minutes.  
Meeting No.24, 5 November 1958.  
Notice of meeting (annotated), 1 p. ms. notes, Minutes.
- E.98 Meeting No.25, 25 February 1959.  
Notice of meeting, Agenda, Minutes.  
Meeting No.26, 11 May 1959.  
Minutes.  
Meeting No.27, 28 September 1959.  
Agenda, Minutes.
- E.99 28th Meeting, 11 January 1960.  
Minutes.  
29th Meeting, 29 February 1960.  
Minutes.  
30th Meeting, 10 June 1960.  
Minutes.  
31st Meeting, 27 October 1960.  
Agenda, 2 pp. ms. notes, miscellaneous diagrams,  
Minutes.

Thermonuclear research

- E.100      32nd Meeting, 23 February 1961.  
                 Agenda, Minutes.
- Meeting No.33, 12 June 1961.  
                 Agenda, Minutes.
- Meeting No.34, 12 October 1961.  
                 Agenda, 8 pp. duplicated typescript re 'A.E.I.  
                 Plasma Research Programme', Minutes.
- E.101      Meeting No.35, 15 March 1962.  
                 Agenda, Minutes.
- Meeting No.36, 10 July 1962.  
                 Minutes.
- Meeting No.37, 16 October 1962.  
                 Agenda, Minutes.
- E.102      Meeting No.38, 15 January 1963.  
                 Agenda, Minutes.
- Meeting No.39, 24 April 1963.  
                 Minutes.
- Meeting No.40, 23 July 1963.  
                 Minutes.
- E.103      C.T.R. [ Controlled Thermonuclear Research ] Advisory  
                 Committee. Minutes of meetings, 1957.  
                 29 July 1957            (1st meeting)  
                 26 November 1957 (2nd meeting)
- E.104      Meeting of C.T.R. Advisory Committee, 18 December 1958.  
                 Folder includes:  
                 Letter from B.F.J. Schonland announcing reconstitution  
                 of 1957 C.T.R. Advisory Committee.  
                 Agenda, Minutes and miscellaneous committee papers.
- E.105      Meeting of the C.T.R. Advisory Committee, 4 November 1959.  
                 Agenda, Minutes and miscellaneous committee papers.

Thermonuclear research

E.106-E.111      Correspondence, 1958-63

In alphabetical order.

- |       |  |         |
|-------|--|---------|
| E.106 | Allibone, T. E.  | 1958-63 |
|       | Allibone's final letter, 4 March 1963, announces the A.E.I. Company's decision to close the laboratory at Aldermaston.   |         |
| E.107 | Chick, D. R.   | 1958-60 |
| E.108 | Hunt, S. E.  | 1960    |
|       | Enclosing reprint of paper by Hunt.  |         |
| E.109 | Pease, R. S.   | n.d.    |
|       | 2 ms. drafts of letters to Pease, one incomplete.  |         |
| E.110 | Tayler, R. J.  | n.d.    |
|       | 2 ms. drafts of letters to Tayler, with several pages of calculations attached.  |         |
|       | Thompson, W. B.  | n.d.    |
|       | Letter from Thomson.   |         |
| E.111 | Ware, A. A.  | 1958-60 |
|       | Includes photocopy of a letter from D. Gabor, 28 January 1958, re 'Langmuir's Paradox' and miscellaneous notes and calculations by Thomson in response to letters or drafts from Ware. |         |

Thermonuclear research

E.112-E.143 Research reports and lectures by others

Most of these were sent to Thomson from the A.E.I. Laboratory, Aldermaston, or A.E.R.E. Harwell for information or comment. They are arranged in alphabetical order of author. Many are undated.

A collection of reprints on thermonuclear energy is included at E.143.

For research notes and drafts by Thomson see E.1 - E.70.

- E.112 Allibone, T. E.  
'Statement for Chairman of Associated Electrical Industries Ltd. Progress in Thermonuclear Research at Associated Electrical Industries Limited, Aldermaston, typescript, 12 January 1958.  
  
Folder also includes a similar typescript draft, no author or date.
- E.113 Allis, W. P.  
'Seminar on the Pinch Effect', duplicated typescript, 29 April 1952.
- E.114 Bickerton, R. J.  
'Scaling hours and the Stable Pinched Discharge', typescript, n.d.
- E.115 Blackman, M.  
'Drift of Electrons at the core of the "Pinch"', typescript, n.d.
- E.116 Hemmings, R. F.  
'Probe Measurements in a Ring Discharge', typescript, 20 March 1952.
- E.117 Herdan, R.  
'Lyapunov-Type Stability Criteria in Plasma Physics and Fluid Dynamics', A.E.I. Research Report, December 1963.
- E.118 Hunt, S. E.  
'The Levitron Experiment. An appreciation for the Plasma Physics Research Sub-Committee', duplicated typescript, n.d., c.1959.

Thermonuclear research

- E.119 Liley, B. S.  
'Sceptre', duplicated typescript, 1957.
- E.120 Sturrock, P. A.  
'Non-linear effects in electron plasmas', typescript, n.d., but accompanied by letter from Sturrock to Thomson, 31 January 1955, and 1 p. ms. notes by Thomson.
- E.121-E.132 Thompson, W. B.
- E.121 'A phenomenological theory of the constricted gas discharge at moderate currents', typescript A.E.R.E. Report, May 1952.
- E.122 'The Diffusion Theory of the Constricted Gas Discharge', typescript (unsigned, probably by Thompson), October 1952.
- E.123 'The theoretical characteristics of constricted discharges in mercury and caesium vapour', typescript draft, October 1952.  
  
Folder also includes final version, distributed as an A.E.R.E. Report, December 1952.
- E.124 'An elementary theory of the Hall effect in a gas discharge', undated typescript and A.E.R.E. Report, February 1954.
- E.125 'The Scaling of the Constricted Gas Discharge', typescript (unsigned, probably by Thompson), n.d.
- E.126 'Gas Discharge Project', unsigned typescript, n.d.
- E.127 'Equilibrium Characteristics of a Pinched Gas Discharge Cooled by Bremsstrahlung Radiation', unsigned typescript, n.d.
- E.128 'Pressure in a Gas Discharge', typescript, n.d.
- E.129 'Neutral Gas Pressure Effects in the Gas Discharge', typescript by Thompson and R.T.P. Whipple, n.d.
- E.130 'Electron Beam as a Magnetic Probe', typescript with 1 p. ms. calculation, n.d.
- E.131 'The Viscous Discharge. A New Model of the Highly Ionised Gas Discharge', typescript by Thompson and S.J. Roberts, n.d.
- E.132 'An Introduction to Plasma Physics'. Set of 8 duplicated typescript lectures, n.d.

Thermonuclear research

E.133-E.138 Ware, A. A.

E.133 'High Current Discharge Research. (Work done by S.W. Cousins and A.A. Ware, March 1949-March 1950)', typescript, n.d.

E.134 'Relativistic Treatment of "Pinch" Forces', typescript, n.d.

E.135 'Low Frequency Ring Discharge Giving Continuous "Pinch" Forces', typescript, n.d.

E.136 'Note on the Theory of the "Pinch" Effect', typescript, n.d.

E.137 'The Radial Electric Field in a High Current Discharge and the Effect of the Discharge Tube Wall', typescript, 1 October 1952.

E.138 'Power Loss due to Current Zeros in a Toroidal Ring Discharge - Suggested 50 cycle Ring Discharge', typescript, 6 January 1953.

E.139 Wesson, J. A.

'The Effects of Stray Magnetic Fields on Plasma Containment', typescript, 17 May 1960.

E.140 Two typescripts with multiple authors:

'Neutrons from Zeta', 1 p. typescript by R. Carruthers and others, 6 September 1957.

'Sceptre, a Stabilised High Current Toroidal Discharge producing High Temperatures', typescript by N.L. Allen and others, 31 December 1957.

E.141 Five unsigned typescripts:

'Conduction of Heat through a Plane Slab', n.d.

'Sceptre 1', n.d.

'Review of Fusion Research at A.E.I. and Future Programme', January 1960.

'A Proposed Tubular Pinch Experiment', May 1960.

'A.E.I. Plasma Research for the Culham Laboratory. Proposed Research Programme for the year 1st April 1962 to 31st March 1963', 12 February 1962.

Thermonuclear research

- E.142      Miscellaneous diagrams, photographs, etc.
- E.143      Bundle of miscellaneous reprints re thermonuclear research.

Thermonuclear research

E.144, E.145

Miscellaneous other material

E.144

Small ring-binder containing lists of articles read by (or recommended to) Thomson, 1959-70.

E.145

Miscellaneous bundles of notes and calculations, all undated, some with titles as follows:

'Slowing down of Space Ship in Earth's Atmosphere'

'Perihelion of projected particle'

'Apparatus for Measuring the Volume of a Chest Cavity'

'Pumping through Tube'

'The Age of the Elements and the Age of the Crust'  
(typescript, probably not by Thomson)

'Ionisation on Balloon Flights'

SECTION F      SCIENTIFIC LECTURES AND WRITINGS F.1 - F.209

F.1 - F.33	University lectures (at Cambridge, Aberdeen, and Imperial College London)
F.34 - F.149	Physics
F.150 - F.209	Nuclear and Thermonuclear Energy

The material in each of the sub-sections is presented in approximate chronological order, though Thomson rarely dated his early notes and drafts; in many cases they can only be roughly dated on internal evidence. The 'University Lectures', especially those given at Aberdeen, were often cannibalised and updated for use at Imperial College, London, and no firm boundary can be drawn except for the post-Second World War lectures at London on cosmic rays and nuclear physics.

The lectures and writings on 'Physics', F.34 - F.149, naturally focus on Thomson's own research interests and discoveries. F.36 - F.61 are almost all on electron diffraction, his own experimental research (for which he shared with C.J. Davisson the Nobel Prize for Physics in 1937) and the wave-particle theory of matter; the number of these, and the range of places at which Thomson was asked to speak, show the international recognition of his work. Several items, F.66 - F.77, deal with the practical applications of electron diffraction, and the electron microscope, as tools of research.

After the Second World War, Thomson continued to write and lecture on the electron, and also on cosmic rays, mesons, and atomic structure. The advent of nuclear, and later of thermonuclear power, however, provided the chief matter of his scientific research and publications. F.120 - F.168 are a crowded cluster of items - including several broadcasts - on the nature and control of nuclear energy, followed by a similar output at F.169 - F.174 on the then new implications of the hydrogen bomb. These problems continue to recur throughout the remainder of the material, some linked with the opening of atomic power stations (F.188 et seq.).

Scientific lectures and writings

Thomson himself made a distinguished contribution to research on nuclear fusion from the early 1940s, and played a part in the development of thermonuclear research at Harwell and A.E.I. Most of his work was not released for publication, but the public announcement of Zeta in 1958 led to many lectures and articles by him, some technical and some more popular, on thermonuclear questions (F.193 - F.205).

The material in this Section is only rarely accompanied by research material or by related correspondence - it should be consulted in conjunction with the notebooks and documents in Sections C and E.

Although several items naturally contain autobiographical and historical reflections by Thomson on his experience of twentieth-century physics, his explicit writings on the history of physics and physicists, and his more general ideas on the methods, purpose and implications of science have been grouped in Sections G and H respectively.

Scientific lectures and writings

F.1-F.33

University Lectures

Lectures at Cambridge, 1919-22

- F.1 Spring-back folder inscribed 'Rigid Dynamics. G.P. Thomson. Corpus Christi'.  
  
Contains ms. notes for a course of thirteen lectures, paginated 1-20, followed by several unnumbered pages of examples.
- F.2 Spring-back folder, with ms. notes for fourteen lectures, many on verso of examination scripts. The first page is inscribed 'Easter Term 1922. Electricity Optics and Hydrostatics Revision'.  
  
Lectures at Aberdeen (1922-30)  
See also F.34.
- F.3 Spring-back notebook, inscribed on first page 'Electricity and Magnetism. Lectures'.  
  
Lectures are numbered 1-10, but material continues on various topics in the subject.
- F.4 Folder of notes inscribed on first page 'Senior Honours Class. Electricity. Oct. 1923'.
- F.5 Folder of notes, inscribed on first page 'Natural Philosophy Ordinary Class'.
- F.6 Folder of loose notes inscribed on first page 'Geometrical Optics'. Some notes on 'Magnetism and Electricity' are also included in the folder, as is a list in Thomson's hand of those attending.
- F.7 Folder of loose notes for 'Senior Honours', on various topics, with a list in Thomson's hand of those attending and marks obtained in 'Mechanics' and 'Heat'.
- F.8 University of Aberdeen candidate's examination book, notes inscribed 'General Dynamics of Multiply Periodic Systems'.
- F.9 Ditto, inscribed 'Notes on Crystal Lattices and Space Groups'.
- F.10 Ditto, inscribed 'Laws of Motion'.
- F.11 Ditto, inscribed 'De Broglie Theory', with some loose sheets similarly headed.

Scientific lectures and writings

- F.12 Folder of loose notes, inscribed on first page 'Mathematics for Students in Physics'. Paginated 1-26, but material continues on similar topics.
- F.13 Folder of notes for a course of eight lectures on 'General wave properties'.  
Several of these contain revisions and insertions and may also have been used at Imperial College.
- F.14 Undated lecture on 'Kinetic Theory', paginated 21-25, perhaps once part of a longer sequence (paper similar to that in F.3).
- F.15 Undated lecture on 'Dielectric Constant'.
- F.16 Undated lecture on 'Atom Structure'.
- F.17 Undated lecture on 'Polarisation of Electrons'.
- F.18 Folder of extensive loose notes on 'Dynamics', with many revisions and insertions, perhaps for later use at Imperial College.
- F.19 Folder of loose notes on 'The Science of Moving Bodies', with 1 p. note of preliminary information for students (at Aberdeen).

Lectures at Imperial College, London (1930-52)

Very few of these can be accurately dated. Thomson probably used revised versions of his earlier lectures at Aberdeen (see F.13, F.18 above), and continued to update the material by intercalating notes or printed matter which sometimes provide a terminus ad quem.

- F.20 'Imperial College. Oct.6. Electron Waves'.
- F.21 'Optical experiments with electrons'.
- F.22 Spring-back folder inscribed 'Elasticity'. Notes for lectures, paginated 1-16(a).
- F.23 Green spring-back notebook of eleven lectures on 'Heat for Engineers'.  
Includes some related printed matter, latest date 1935.

Scientific lectures and writings

- F.24 Spring-back folder inscribed 'Ionic Physics'.  
Notes begin in 1930s and are updated into 1940s and include note of sections of course which Thomson delegated to colleagues Cochrane and Barford.
- F.25 'Introductory Lecture to Modern Physics'.  
Early notes with later additions interleaved.
- F.26 'Relativity Mechanics'.  
Early notes with later additions.
- F.27 Folder of notes on various topics in physics, with various revisions and additions on nuclear physics and cosmic rays.  
Includes a letter and data from F.A. Paneth, 1947.
- F.28 Spring-back folder inscribed 'Harmonic Motion'.  
Early notes with some later additions (latest date 1946).
- F.29 Spring-back folder inscribed 'Wave Motion'.  
Notes for a course of eleven lectures; includes related printed matter, 1949.
- F.30 Spring-back folder inscribed 'Discarded pages from Wave Motion lectures'.
- F.31 Spring-back folder inscribed 'Atomic Physics Part II', of notes for lectures on atomic and nuclear physics.  
Includes a note headed 'Garton's Lectures' (W.R.S. Garton, FRS) on topics already dealt with in students' courses, 1949 and 1951.
- F.32 Spring-back folder inscribed 'Work at Imperial College on Cosmic Rays'.  
Includes notes for lectures by Thomson at Imperial College and elsewhere, his notes on the literature, etc. (latest date 1951).
- F.33 Thomson's notes on work by Blackett, Heitler and others on elementary particles.

Scientific lectures and writings

F.34-F.149

Physics

- F.34 'Modern Ideas about Atoms'.  
13 pp. ms. lecture, with introductory notes on verso of last page; probably for Inaugural Lecture at Aberdeen. P.10 of ms. refers to a suggestion 'recently' by Rutherford that a new particle should be named 'proton' (suggestion made in Rutherford's speech to British Association, September 1920).
- F.35 'Electron Optics'. n.d.
- F.36 Notes for 'British Association Discussion'.  
Ms. notes in which Thomson describes his classic electron diffraction experiment.  
n.d. but probably for meeting at Glasgow, September 1928, at which de Broglie and Davisson were also present (see Moon, Biographical Memoirs of Fellows of the Royal Society, 23, 1977, p.538).  
Includes press-cuttings of Davisson's and Thomson's contributions, and of a note by Thomson 'The Disintegration of Radium E from the Point of View of Wave Mechanics' (Nature, 121, 615-6).
- F.37 'New Discoveries about Electrons'.  
9 pp. ms. talk for radio with sections marked 'to be omitted for publication in the "Listener"'. n.d., 1927-28.
- F.38 'Waves and particles'.  
2 pp. ms. talk, c.1928.
- F.39 'Waves or Particles'.  
7 pp. typescript proof of article for publication in a French journal.  
n.d., probably 1929 (death of A. Reid mentioned 'in July last year' [1928]).
- F.40 'Diffraction of Electrons. Lecture at University College Feb.8/29'.  
3 pp. ms. notes.
- F.41 'New Discoveries about Electrons'.  
Talk or lecture given 13 August 1929, place unidentified. 6 pp. typescript.

Scientific lectures and writings

- F.42, F.43 Two lectures on mechanics. Undated, but c.1930.
- F.42 'Fundamental Ideas of Mechanics'.  
4 pp. ms.
- F.43 'New Mechanics'.  
2 pp. ms.
- F.44, F.45 Two lectures given at Manchester. n.d., c.1930.
- F.44 'The new mechanics'.  
2 pp. ms.
- F.45 Untitled notes for lecture on electron, headed 'Lecture  
Nov. 30 Manchester'.
- F.46, F.47 Two lectures on relativity. No date or place.
- F.46 'The limitations of relativity'.  
3 pp. ms.
- F.47 Lecture on 'Relativity considerations', headed 'Lecture 4'.  
3 pp. ms.
- F.48-F.55 Lectures in America.  
Almost all on wave/particle atomic theory, electron,  
uncertainty in physics.  
Thomson visited America September 1929-Spring 1930.
- F.48 'Electron Diffraction. Univ. of New York Lecture 1'.  
4 pp. ms.
- F.49 'New York Chemical Society'.  
2 pp. ms.
- F.50 'Lecture at Rochester'.  
2 pp. ms.
- F.51 'Franklin Institute'.  
2 pp. ms.

Scientific lectures and writings

- F.52 'Smith College'.  
2 pp. ms.
- F.53 'Columbus'.  
Notes for four lectures. 9 pp. ms.  
With a letter of thanks from the Secretary, American  
Chemical Society, Columbus Section
- F.54 Notes for a series of four lectures, no indication of place.  
15 pp. ms.
- F.55 Shorter sequences of notes for lectures:  
'Homopolar Bonds'  
5 pp. ms.  
'Spin'  
2 pp. ms.  
'Electron Diffraction. 2 lectures'  
1 p. ms.
- F.56 Lectures in Canada  
'Schenectady' (on wave/particle theory).  
4 pp. ms.  
1 p. notes for similar lecture at McGill University.
- F.57 Lectures in India  
'Electron Diffraction Bombay'.  
2 pp. ms.  
'Electron diffraction Lahore'.  
1 p. ms.  
Lecture on the history and teaching of science, given to  
'Rotary Lahore'.  
2 pp. ms. notes.

Scientific lectures and writings

- F.58 Shorter notes for lectures on electron diffraction and wave/particle theories. None dated, c.1930-32.  
Given at Sir John Cass College (London), Alembic Club, Amsterdam, Birkbeck College (London), British Association, Leeds.
- F.59 Lecture on 'Modern Physics'.  
n.d. 5 pp. ms.
- F.60 'The Waves of an Electron'.  
Ms. and typescript draft for illustrated lecture, possibly 1928.
- F.61 Shorter notes for talks or lectures on electron diffraction, n.d.
- F.62 'Optical Experiments with Electrons'.  
3 pp. ms. notes 'extracted from a lecture to the Optical Society'.  
The formal lecture was published in Trans.Opt.Soc., 32, 1930.
- F.63 Book Reviews.  
Rutherford, Chadwick and Ellis: 'Radiations from Radioactive Substances'.  
For The Electrician, typescript, 1931.  
Fraser: 'Molecular Rays'.  
For Journal of Scientific Instruments, proof, 1932.
- F.64 Book Review.  
Randall: 'Diffraction of X rays and electrons'.  
For the Physical Society, typescript, 1934.
- F.65 'Experiments on the polarisation of electrons'.  
Ms. draft, and corrected typescript versions of paper published in Phil.Mag., 17, 1934.
- F.66 'The small-scale structure of surfaces'.  
Typescript and ms. draft of paper published in Phil.Mag., 18, 1934.

Scientific lectures and writings

- F.67 Book reviews.
- Meyer: 'The Diffraction of Light, X-rays and Material Particles'.
- de Boer: 'Electron Emission and Adsorption Phenomena'.
- Both for Proc. Phys. Soc., 1935.
- F.68-F.70 'Applications of Electron Diffraction'.
- Lectures given at the Royal Institution, January-February 1935.
- F.68 Ms. notes for four lectures.
- F.69 Ms. notes, diagrams, etc. related to lectures.
- F.70 'Electron Diffraction as a Method of Research'. Summarised version of lectures, prepared for publication in Nature, 30 March 1935, with brief editorial correspondence and reprint of article as published.
- F.71 'Absorption Coefficients'.
- 9 pp. typescript, n.d.
- Perhaps a report submitted to Thomson and not by him.
- F.72 Book reviews.
- Grimsehl: 'Physics of the Atom'.
- Laporte: 'Phénomènes Élémentaires de la Décharge Électrique dans les Gaz'.
- Von Laue: 'Die Interferenzen von Röntgen-und Elektronenstrahlen'.
- All for Proc. Phys. Soc., 1936
- de Broglie: 'Matter and Light, the New Physics'. n.d.
- F.73 'Positive Electrons'.
- 2 pp. ms. notes for talk or lecture, n.d.

Scientific lectures and writings

- F.74 'Electron Waves as a Tool of Research'.  
16 pp. ms. draft for illustrated lecture.  
Includes 2 pp. ms. notes on subject, and related offprint, n.d., c.1936.
- F.75 'The Electron in Research'.  
Ms. draft, and corrected typescript versions of illustrated talk (refers to work at Imperial College), n.d., c.1936
- F.76 'The electron microscope'.  
6 pp. ms. and typescript, n.d., c.1937.
- F.77 'The Electron Microscope'.  
17 pp. typescript with ms. corrections, and a photograph.  
An extended version of F.76, for publication in Endeavour, 8.  
Includes galley proof for published article.
- F.78 'Electronic waves'.  
Nobel lecture, delivered at Stockholm, 7 June 1938.  
11 pp. typescript with ms. corrections.  
Thomson was awarded the Nobel Prize for Physics in 1937 but was unable to attend the ceremony that year because of ill health.  
Another version, with additional ms. material, and a 1 p. introductory page headed 'National Academy of Sciences'.  
See A.26 for related correspondence.
- F.79 'The velocity distribution of thermal neutrons'.  
2 pp. typescript draft of collaborative paper published in Nature, 142, 1938.
- F.80 'La diffraction des Electrons'.  
1 ms. and 2 typescript versions of lecture in French.  
2 typescript versions of lecture in English, one with a note 'Paris Nov. 1938'.  
See J.106 for related correspondence.

Scientific lectures and writings

- F.81 Shorter notes for lectures, on 'refractive index', and on 'Analysis of surface layers'. n.d.
- F.82 'Electron Diffraction'.  
The May Lecture, delivered to the Institute of Metals, 19 May 1943.  
11 pp. typescript with ms. corrections, and  
1 p. 'Summary'.  
Proof of lecture and diagrams for publication.
- F.83 1 p. ms. notes for lecture on wave/particle theory, headed 'Aberdeen. Dec. 29 1947'.
- F.84-F.87 'The Growth of Crystals'.  
The thirty-second Guthrie Lecture, delivered 4 June 1948 and published in Proc. Phys. Soc.
- F.84 Ms. and typescript 'Notes for Guthrie lecture', draft text, ms. additions for insertion, galley proofs of text for publication.
- F.85 Four sequences of notes by Thomson on crystal growth (one dated March 1938).
- F.86 Five sequences of notes and data, by Thomson and others, related to lecture.
- F.87 Sequence of notes on crystal growth, not in Thomson's hand but lent by him to R. Furth and returned with letter of thanks.
- F.88 'High energy electrons'.  
7 pp. typescript paper on production and uses of high energy particles.  
n.d., perhaps not by Thomson.
- F.89 'The production of cosmic ray stars' (Phil. Mag., 40, 1949).  
13 pp. ms. draft.  
Heavily corrected first proof, 16 pp.
- F.90 'Origin of stars'.  
Ms. notes and draft.
- F.91 4 pp. draft for talk on similar subject, with heading 'Dublin Feb. 10 1949'.

Scientific lectures and writings

- F.92 Three bundles of ms. notes on subject. n.d.
- F.93 Shorter notes:
- 1 p. on topics in physics
  - 1 p. notes for a talk on crystallographic analysis of molecules
  - 1 p. notes 'Stockholm Dec. 1950' (perhaps at Nobel Prizewinners gathering)
  - ms. and typescript 'Conclusion' to work on electron
- F.94 Book review.
- De Broglie: 'Interaction entre le noyau et son cortège électronique'.
- For Endeavour; ms. notes, typescript of review.
- F.95 Two talks on 'Photographic Study of Cosmic Rays'.
- 2 pp. notes headed 'Aldermaston September 20 1950'.
  - 1 p. notes headed 'Aberdeen March 1951'.
- F.96 'Electrons: particles and waves'.
- Talk for BBC 'Science Survey', May 1951.
  - 9 pp. typescript draft; transcript of programme as broadcast.
- F.97 'The Study of Solid Surfaces'.
- 16 pp. typescript with ms. corrections, dated July 1952, with two loose pages of notes.
- F.98-F.103 'The Second Law of Thermodynamics deduced from information theory'.
- Drafts, abstracts and notes, as follows:
- F.98 Ms. draft, with title 'The Second Law of Thermodynamics stated in terms of Information Theory'.
- F.99-F.101 Three ms. and typescript drafts, all with extensive alterations.
- F.102 Extensive notes and calculations, some in ten bundles as kept by Thomson, others as loose pages.
- F.103 Letter from G. Beck with comments on the draft paper. n.d.

Scientific lectures and writings

F.104-F.109 'Heavy Meson'.

The Poynting Lecture, delivered at the University of Birmingham, July 1952.

Drafts, notes and background material, as follows:

- F.104 Ms. and typescript draft of lecture.
- F.105 Duplicated version for distribution.
- F.106 'Mesons', ms. and typescript notes and drafts, with a heading 'Portugal'.
- F.107 'Capture of  $\mu$  mesons by heavy nuclei', ms. draft and notes, with a heading 'Not published'.
- F.108, F.109 Miscellaneous background material, reprints, conference proceedings, notes by others on the subject.
- F.110 1 p. ms. notes for a lecture on 'Meson', with a note 'Nat. Sci. Club Feb. 25 1954'.  
Miscellaneous background material on the subject, offprints, drafts and notes, including Atomic Scientists Journal, September 1953, with annotations by Thomson.
- F.111 Two lectures on Electron Diffraction given by Thomson on his visit to South America, 1954.  
2 pp. ms. notes 'Montevideo Electron Diffraction'.  
2 pp. ms. notes 'Rio de Janeiro'.
- F.112 Two lectures on Electron Diffraction given by Thomson on his visit to the Middle East, 1955.  
2 pp. typescript and 2 pp. ms. notes 'Beirut, Damascus, Baghdad'.  
2 pp. typescript and 1 p. ms. notes 'Damascus. Electron Diffraction'.
- F.113 Article on current developments in physics research, for The Financial Times, 1957.  
5 pp. typescript, with brief editorial correspondence.

Scientific lectures and writings

- F.114, F.115 'The Containment of Plasma by the Pinch Discharge',  
Phil.Mag., 3, 1958.
- F.114 Heavily corrected ms. draft, 12 pp. + 1 p. diagram.
- F.115 Heavily corrected first proof, 16 pp. + 3 figs., marked  
'Rec. May 16 1958'.  
Brief correspondence with N.F. Mott re publication of  
article in Phil.Mag., 1958.  
This is based on one of Thomson's research papers  
prepared for, or related to, work on thermonuclear power  
at A.E.I./Harwell.  
For similar, unpublished material, see E.34, E.35.
- F.116 Draft chapter on 'Light', for proposed book on physics for  
adults, which Thomson was asked to contribute to a series  
published by Harper and Brothers.  
22 pp. typescript with ms. revisions.  
Correspondence with J.R. Newman of Harpers, May-  
December 1958.
- F.117-F.122 'The Principles of Physics', article published in The Saturday  
Evening Post, 1959.
- F.117 First ms. draft, 27 pp.
- F.118 First typescript version, 18 pp.
- F.119 'Re-written' typescript version, 19 pp.
- F.120 Biographical notes to accompany article, 3 pp. typescript.
- F.121 Correspondence with editors re correction and publication of  
article, and later reprinting in 'Adventures of the Mind'  
under title 'What you should know about physics', 1958-61.
- F.122 Correspondence re photograph for article, 1959, and re  
French translation, 1960.
- F.123 'Principles of Physics'.  
The Fison Memorial Lecture, delivered at Guy's Hospital,  
12 May 1959.  
3 pp. typescript, using similar material to above, with  
related correspondence.

Scientific lectures and writings

- F.124 Speech at annual dinner, Institute of Physics, 3 May 1960.  
3 pp. typescript with ms. corrections.
- F.125 Book review.  
  
de Broglie: 'New Perspectives in Physics'  
For Bulletin of Institute of Physics, 1962.
- F.126 Speech at Inaugural Dinner, Plasma Physics Group.  
3 pp. ms. n.d., c.1965.
- F.127-F.133 'Matter and Radiation'.  
Thomson's contribution to Aspects of Scientific Thought, 1900-60,  
ed. H.R. Harré (O.U.P.).
- F.127 Correspondence with publishers and editor re plans for book,  
Thomson's contribution, photographs and illustrations, 1966-68.
- F.128,  
F.129 Letters from colleagues with comments or advice, 1967.
- F.130 Thomson's plan, list of illustrations, ms. drafts, on loose  
pages, and in spiral-bound notebook.
- F.131 Typescript with ms. corrections, 79 pp.
- F.132 Proof copy, with publisher's and author's corrections, pages  
numbered 71-150.
- F.133 'Corrected proof', date-stamped May 1968.
- F.134-F.138 Jubilee meeting of the Institute of Physics, 6-9 May 1968.  
  
The first paper of the meeting, on 'The Atom Outwards',  
was to have been given by Sir Lawrence Bragg, who fell ill  
shortly before the meeting. Thomson was asked on 23 April  
to take his place, and his paper was subsequently published  
in Physics Bulletin, 19, December 1968.
- F.134 Correspondence re meeting. Includes ms. letter from Bragg,  
written from his sick-bed and including 5 pp. draft notes for  
speech (p.3 is missing and is included in Thomson's draft at  
F.136).

Scientific lectures and writings

- F.135 Contributions and information from colleagues, originally sent to Bragg and passed on by him to Thomson. Includes material from D.W. Sciama, M. Ryle, J.A. Ratcliffe, some annotated by Thomson.
- F.136,  
F.137 Ms. and typescript versions of Thomson's paper.
- F.138 Printed notice of meeting.
- Offprint of article 'The structure of matter - the atom outwards', based on the lecture and published in Physics Bulletin.
- F.139-F.146 'The Electron'.  
Booklet published in 'Understanding the Atom' series by United States Atomic Energy Commission, 1971.
- F.139 Correspondence with editor and colleagues. Includes invitation to write booklet, financial and publication arrangements, etc., permission to reproduce material, 1969-70.
- F.140 Ms. draft of book.
- F.141 Ms. notes, photographs.
- F.142 Typescript draft, with ms. corrections, and including reviewers' comments and Thomson's answers.
- F.143 Typescript version, with many ms. corrections and additions.
- F.144 Correspondence with editor re proofs and artwork of article, and including Thomson's answers to queries on captions, December 1970-January 1971.
- F.145 Galley proof, with a few corrections and additions.
- F.146 Final proof of book, with covering letter, September 1972.
- F.147-F.149 'An Unfortunate Experiment'.  
Article published in Notes and Records of the Royal Society, 25.
- F.147 Correspondence with R.V. Jones (Editor, Notes and Records) re paper.
- F.148 Ms. draft, and ms. notes for paper.
- F.149 Typescript and galley proof versions, all with some corrections.

Scientific lectures and writings

- F.150-F.209      Nuclear and Thermonuclear Energy
- F.150      'Atomic Energy'.  
2 pp. ms. notes, n.d. A short general talk with no mention of atomic weapons, and a ms. note 'Special position of Canada'. Perhaps delivered in Canada 1942; see also H.92-H.94 for other lectures given in Canada 1941-42.
- F.151      Short broadcast for 'The Voice of America', on peaceful uses of atomic energy, 13 August 1945.
- F.152      'Ethics of Atomic Bomb'.  
Typescript draft, undated, with ms. note 'I Tizard, I to Wimperis'.  
Duplicated version, 2 pp., dated September 1945.
- F.153      Ms. notes for shorter talks on atomic energy, 1945.  
'Imp. Coll. Debating Soc. Principles of the atomic bomb'  
'Atomic Energy. North London Collegiate School'  
'Atomic Energy. Aberdeen. Dec.1 1945', also given at 'London Hospital Jan. 22/46'
- F.154      'Atomic Energy'.  
Address at Inaugural Meeting, Junior Institution of Engineers, 8 December 1945. Thomson was President of the Institution.  
6 pp. typescript with ms. revisions.
- F.155      Ms. notes for shorter talks on atomic energy, 1946.  
'Atomic Energy. Canadian Khaki University Jan. 1946'  
'Manchester Feb. 6 1946'  
'Atomic Power. Chatham House March 5 1946'  
'Charterhouse March 11 1946'
- F.156      'You and the Atom'.  
Talk broadcast by Columbia Broadcasting System, August 1946.  
Draft and revised script.  
Transcript of remarks as broadcast.  
Brief correspondence re arrangements.

Scientific lectures and writings

- F.157 Ms. notes for talks, n.d., c.1946.  
'Ashridge. Atomic Energy in Peace and War'  
'Prospective Uses of Atomic Energy. Chatham Club'  
Untitled notes on applications of atomic energy
- F.158 Ms. notes for shorter talks on atomic energy, 1947.  
'Atomic Energy. Science Masters Association,  
Jan 2 1947'  
'Oxford Physics Club. Atomic Energy.  
Feb 4 1947'  
'Society Instrument Technology, Billingham  
May 20 1947'  
'Maths and Physics Soc. Atomic Energy.  
Oct 16 1947'  
'Society of Glass Technology. Atomic Energy  
Oct 15 1947'
- F.159-F.163 Broadcasts, 1947.
- F.159 'Atomic Energy and International Control'.  
Broadcast in BBC European Service, 27 January 1947.  
5 pp. typescript with ms. corrections.
- F.160- Contributions to 'Atomic Energy Week' broadcasts in BBC  
F.163 Home Service, March 1947.
- F.160 'The Military Uses'.  
Ms. draft of Thomson's contribution.  
Schedule of speakers, rehearsals and broadcasts.
- F.161 Transcript of 'The Military Uses', including contributions  
by G. Cheshire, J. Bronowski and Thomson.
- F.162 'International Control'.  
Ms. notes headed 'B.B.C. Discussion'.  
Typescript version with ms. revisions and insertions.
- F.163 Transcript of talk.

Scientific lectures and writings

- F.164 'Peaceful Uses of Atomic Energy'.  
Ms. and typescript versions of Thomson's contribution to report of Church Assembly Atomic Energy Discussion Group.
- F.165 Shorter talks and lectures, n.d., c.1947.  
'Atomic Energy (Aberdeen)'  
'Future of Atomic Energy (Hoover)'  
'Luton A.R.P.'  
'Is a Moratorium on Power Production Desirable?' with a ms. note 'for Chatham House'
- F.166 Talk on international control of atomic energy, given at conference of Atomic Scientists' Association, October 1948.  
Programme of conference, 1 p. ms. notes, 6 pp. typescript version with ms. additions.
- F.167 Notes for shorter talks.  
'Consequences of Atomic Energy', dated December 1948.  
'Hereford. The Future of Atomic Energy', n.d., c.1948  
'The Russian Atomic Explosion', n.d., c.1948
- F.168 Ms. notes for shorter talks on atomic energy, 1949.  
'Working Men's College. Atomic Energy. Jan 14/49'  
'Dublin Feb.9. 1949'
- F.169-F.172 Notes and talks on the hydrogen bomb, 1950.
- F.169 'The Hydrogen Bomb'.  
Talk on BBC Third Programme, 14 March 1950  
Heavily corrected ms. draft.  
Typescript version with ms. corrections.  
Letter from listener.
- F.170 Ms. notes for talk on the hydrogen bomb, Chatham House, July 1950.  
Introductory remarks by Rector, Imperial College.  
Shorter notes for talk at Rugby, July 1950.

Scientific lectures and writings

- F.171 Notes, calculations and narratives on structure, explosion and radioactivity of hydrogen bomb.  
(Used by Thomson as basis for his talks.)
- F.172 Correspondence from colleagues on radioactivity of hydrogen bomb, 1950.
- F.173, F.174 'The Effects of Atomic Weapons'.  
Talk on BBC Third Programme, 4 February 1951.
- F.173 Ms. and typescript versions of talk.
- F.174 Correspondence re arrangements for broadcast.  
Correspondence arising from talk.
- F.175 Book Review.  
Laurence, Hollis and Carter: 'The Hell Bomb'.  
For New Statesman and Nation, May 1951.
- F.176-F.178 Paper on wartime cooperation on atomic energy, written for Central Office of Information, 1952.
- F.176 Ms. and two typescript drafts, titled 'Cooperation between Britain and U.S.A. in the early days of Atomic Energy'.
- F.177 Paper as produced by C.O.I., titled 'Wartime Development of Atomic Energy. Co-operation between Two Nations'.  
Correspondence with C.O.I. re paper, and re publication in American Scientist.
- F.178 Copy of American Scientist, 41, January 1953, in which the article appears, titled 'Cooperation in Atomic Energy', and with some errors corrected in ms.  
Affixed to the first page is a note, 3 January 1955, on the interpretation of Niels Bohr's telegram referring to 'Maud Ray Kent'.
- F.179 Book Review.  
H.M.S.O.: Harwell: The British Atomic Energy Research Establishment.  
7 pp. ms., no indication of place of publication.

Scientific lectures and writings

- F.180 Ms. notes for shorter talks, 1952.  
'Oxford Jan 23 1952 Use and abuse of atomic energy'  
'Atomic Energy. Lahore' (on verso of invitation to farewell dinner and presentation at Imperial College on Thomson's move to Corpus Christi, Cambridge).
- F.181, F.182 'Morals of Atomic Energy'.  
Thomson's contribution to a course of six University Extension Lectures, organised by University of London Department of Extra-Mural Studies and The Atomic Scientists' Association, and delivered January-February 1954.
- F.181 Two copies of lecture, typescript, one having ms. corrections.
- F.182 Copy of lecture 'Atomic Energy and Moral Issues', given by K. Lonsdale on the same occasion, and correspondence.  
Particulars of meeting, and of follow-up discussion meetings in March 1952.  
Brief correspondence with organiser.
- F.183 Broadcast 'The Hydrogen Bomb', on BBC Third Programme, 15 June 1954.  
Ms. notes and calculations.  
Typescript draft with ms. corrections, and press-cutting reporting speech.  
Final typescript version.
- F.184 'The technical possibility of the control of atomic bombs'.  
Article in The Spectator, February 1955.  
Ms. and typescript versions.
- F.185 'Atoms and Nuclei'.  
Talk given on Middle East tour, with a note 'Damascus, Aleppo, Baghdad, Beirut', 1955.
- F.186 'Possibilities of Thermonuclear Power'.  
Article for The Financial Times, January 1956.  
3 pp. typescript.

Scientific lectures and writings

- F.187 'Atomicity and Patterns'.  
The Twenty-Fifth Joseph Henry Lecture, delivered on 20 April 1956 before the Philosophical Society of Washington.  
2 typescript versions, with slightly different ms. corrections.
- F.188 'The Nuclear Age'.  
Article for The Glasgow Herald Supplement on opening of Calder Hall, October 1956.  
7 pp. typescript.
- F.189 'Britain's Drive for Atomic Power'.  
Article for Foreign Affairs (an American quarterly review), 1956.  
Editorial correspondence, typescript of article with minor ms. corrections.
- F.190 Shorter talks, 1957.  
'Some possible peaceful uses of atomic energy', King's Lynn, January 1957.  
'Atomic Bomb Peshawar March 1957'.  
'The Future of Uranium in the Production of Power'.  
Article for Optima, May 1957.
- F.191 'The Containment Problem for Thermonuclear Reactions'.  
Address to Section A, British Association, at its meeting in Dublin, September 1957.  
2 typescript versions, with different ms. corrections and additions.  
Correspondence re security clearance for paper.
- F.192 'The Consequences of Atomic Fission'.  
Article for series 'Twentieth Century Turning Points' in Technology, December 1957.  
Editorial correspondence, 7 pp. typescript of article with ms. corrections.

Scientific lectures and writings

Many of the articles and talks for 1958 deal with 'Zeta', the thermonuclear project at Harwell which had been announced to the general public.

F.193 Article for The New Scientist, January 1958.

Correspondence, typescript.

Article for The Sunday Times, January 1958.

Correspondence, typescript.

Interview on BBC 'At Home and Abroad', January 1958.

F.194 Notes for contribution to Discussion Meeting on thermo-nuclear reactions, held at Royal Society, February 1958.

'Economics of Nuclear Power'.

Notes for talk to 'Marshall Society', February 1958.

Notes for talk 'Thermonuclear' at St. Louis, March 1958 and Cambridge Phil. Soc., April 1958.

F.195 'British Nuclear Industry'.

Notes for talk to Federation of British Industries Nuclear Energy Conference, April 1958.

'Atoms for Peace'.

Notes for talk to 'Oxford Conservatives', July 1958. (On verso of notes is a list of characteristics of Lord Cherwell, obtained from his servant J. Harvey, presumably for use by Thomson in his Memoir of Cherwell. See G.53ff.).

Article for News Chronicle, August 1958.

Correspondence, typescript of article.

F.196 Article for Central Office of Information, August 1958.

Typescript, correspondence re article and re publication in German periodical Universitas.

F.197 'The H Bomb a necessary evil?'

Ms. notes for talk at Imperial College, October 1958.

Foreword to book 'Man-made sun', by J.D. Jukes.

Scientific lectures and writings

- F.198 1 p. ms. notes for 'Geneva Conference', perhaps for press release. n.d. [1958].
- Book review.
- Heisenberg: Philosophic Problems of Nuclear Science.  
Ms., no indication of place of publication.
- F.199 Shorter talks, 1959.
- 'Nuclear Weapons'.
- Notes for 'Talk Dinner' at Athenaeum, January 1959.
- Talk at 'British Nuclear Energy Conference', 4 pp. ms. notes, April 1959.
- 2 pp. notes for talk to 'Archimedean', October 1959.
- 1 p. notes for talk, n.d.
- F.200-F.204 'Thermonuclear Reactions'.
- Drafts and versions of a lecture so titled, given in various places, 1959-60.
- F.200 Ms. draft, 9 pp.
- F.201 Ms. and typescript draft incorporating new material and with ms. heading 'Soviet thermonuclear scheme with Joffé windings'.
- F.202 Typescript and ms. version, with a heading 'Institute of Physics, London and Home Counties, 14 January 1959. Also Holland. Also Aberdeen and Glasgow October 1959'.
- F.203 Typescript and ms. version, with several ms. pages of new material, given in New Zealand
- F.204 Typescript version with ms. corrections, given at meeting of Nobel Prize Winners at Lindau, June-July 1959, and also in U.S.A. 15 pp.
- F.205 'Thermonuclear Development'.
- Article circulated by Central Office of Information via The New Scientist, November 1959-January 1960.
- 9 pp. typescript, with a little editorial correspondence.

Scientific lectures and writings

- F.206 Book reviews, 1959.
- Ed. Leontovich: 'Plasma physics and the problem of controlled thermonuclear reactions'.  
For British Journal of Applied Physics.
- Ed. Longmire et al: Progress in nuclear energy Series XI. Plasma physics and thermonuclear research.  
For British Journal of Applied Physics.
- Brown: 'Basic data of plasma physics'.  
No indication of place of publication.
- F.207 Preface to R.W. Clark's book on history of atomic bomb, 1960.  
See also D.20.
- Review of proceedings of 1958 Geneva Conference, 1960.  
No indication of place of publication.
- F.208 Foreword to 'The Atom', a subject encyclopaedia.  
Ms. and typescript versions.  
Brief editorial correspondence.
- F.209 Book review.
- Schonland: 'The Atomists', 1968.  
No indication of place of publication.

SECTION G                      HISTORY OF PHYSICS AND PHYSICISTS G.1 - G.116

G.1 -G.32      History of physics.

G.33-G.116      Obituaries, lectures and writings on  
physicists.

For other writings by Thomson, particularly on the history of  
the electron and the work of J. J. Thomson, see the collection of the papers of  
J. J. Thomson (CSAC no. 74/4/80) in the Library of Trinity College, Cambridge.

History of physics and physicists

G.1-G.32 HISTORY OF PHYSICS

- G.1 'The early history of the electron'.  
The Pupin Lecture, Columbia University, 13 April 1956.  
Typescript with ms. corrections, 11 pp.
- G.2 Speech at Commemorative Banquet of the International  
Conference on Electron Physics, Baltimore, 23 April 1956.  
(On J. J. Thomson and the discovery of the electron.)

Transcript of speech with ms. corrections.

Typescript with a few ms. corrections.

This was published in Physics Today, August 1956, a copy of which is included with the collection of J. J. Thomson's papers (CSAC no. 74/4/80, item D.20) in the Library of Trinity College, Cambridge).

- G.3 'Discovery of the Electron'.  
Typescript draft with ms. corrections and additions, 13 pp.  
Typescript draft with a few ms. revisions, and a note 'Scientific American 1957', 14 pp.  
Includes editorial correspondence with Scientific American, 1956-57, and with British Journal of Physical Medicine, 1957.
- G.4 'Physics yesterday and today'.  
Address given to 'The Robert A. Welch Foundation Conferences on Chemical Research. III. Molecular Structure', held in Houston, Texas, 16-18 November 1959, and published as Chapter III of Conference Proceedings.  
Typescript draft with ms. additions and corrections, 16 pp.  
Offprint of published paper.
- G.5, G.6 'Nuclear energy in Britain during the last war'.  
The Cherwell-Simon Lecture, Oxford, 18 October 1960.
- G.5 Typescript draft, with many corrections and additions in the hand of Thomson, N. Kurti and another. 22 pp.
- G.6 Plans for lecture, notes, chronology.  
Notes of conversations with Arms, Kuhn and Kurti.

History of physics and physicists

- G.7 'Early Work in Electron Diffraction'.  
Paper delivered as part of a programme on 'Topics in the History of Modern Physics', at a joint session of the American Physical Society and the American Association of Physics Teachers, New York, 1961, and published in American Journal of Physics, 29, December 1961.  
Ms. draft (incomplete), 4 pp.  
Typescript from tape, with ms. corrections, 8 pp.  
2 offprints of published version, both with ms. notes.
- G.8 'Fifty Years of Physics and Their Consequences'.  
Lecture at Rice University, October 1962.  
Typescript with ms. corrections and additions.
- G.9 'Discovery of the Electron'.  
3 pp. ms. notes, given on various occasions, 1963-64.
- G.10 'The middle years'.  
With a note 'Lecture no.2 delivered at London University' and sub-titled 'The particle electron in power', March 1964.  
Ms. draft with many corrections and insertions.  
Typescript draft with ms. corrections and insertions.
- G.11 'Science and Society in the Thirties'.  
Transcript of broadcast in BBC Third Programme, 10 December 1965, with contributions by Thomson and many colleagues.
- G.12 'History of the Electron'.  
Lecture at Nobel Prize Winners Conference, Lindau, 1965. Subsequently published in Naturwissenschaftliche Rundschau.  
Ms. draft, 15 pp.  
Typescript version with ms. corrections and additions, 16 pp.  
2 pp. summary.
- G.13 'Electron, Proton and Neutron'.  
Second in a series of four talks on the history of the atom, broadcast in BBC World Service, 27 May 1966.  
Ms. draft, 6 pp.  
Transcript as broadcast.  
Brief correspondence re talk.

History of physics and physicists

- G.14, G.15 'The Septuagenarian Electron'.  
Paper read at a joint meeting of the American Philosophical Society and the American Association of Physics Teachers, New York, January 1967, and subsequently published.
- G.14 Ms. notes, plan, heavily corrected drafts, and summary.
- G.15 Typescript copy with ms. corrections, 15 pp.  
Letter re publication.
- G.16-G.18 'The Early History of Electron Diffraction'.  
Lecture delivered before the Institute of Physics and the Physical Society at a meeting held in Glasgow in July 1967 to commemorate Forty Years of Electron Diffraction, and subsequently published in Contemporary Physics, 9, 1968.
- G.16 Ms. draft (indicating where material should be incorporated from previous similar lectures).
- G.17 Miscellaneous typescript drafts, all with revisions and corrections. (4 versions in all.)
- G.18 Corrected typescript prepared for publication, with references, captions, etc.
- G.19 Anniversary Conference on Electron Diffraction, held at Imperial College, July 1967.  
2 pp. typescript account of the conference.  
4 pp. typescript notes on recent developments in electron diffraction, prepared by M. Blackman for W.L. Bragg and forwarded by Thomson.
- 'Reconciling the apparently irreconcilable - the early history of electron diffraction', shortened version of G.18, given by Thomson at the Conference and published in Physics Bulletin.
- G.20, G.21 'History of Physics in the Earlier Part of this Century'.  
Lecture at Nobel Prize Winners Conference, Lindau, 1968.
- G.20 Ms. draft, 16 pp.  
1 p. Summary.  
Typescript version, extensively revised and corrected for publication in Naturwissenschaftliche Rundschau, 15 pp.
- G.21 Correspondence with organisers and editor, conference programme, etc.

History of physics and physicists

- G.22-G.25 'The Nobel Prizes in Physics 1937'.  
Essay for physics volume of a series to be published by Fratelli Fabbri, Milan.
- G.22 Ms. drafts.
- G.23 Typescript drafts and corrections, sent September 1968, October 1968.
- G.24 Final heavily corrected typescript draft.
- G.25 Editorial correspondence re drafts, corrections, contract, payment, etc., February 1968-April 1970.
- G.26-G.28 Jubilee article, Institute of Measurement and Control.  
Prepared for the Jubilee issue of Measurement and Control, May 1969.
- G.26 Ms. and typescript versions.  
Ms. notes.  
Brief editorial correspondence.
- G.27 Short ms. notes for talks in Manchester and Glasgow, January-February 1945, on the Society for Instrument Technology (predecessor of Institute of Measurement and Control until 1967). Thomson was first President of the Society. See A.28.
- G.28 Miscellaneous offprints and printed matter re the Institute.
- G.29, G.30 Article for the Centenary of the Physical Society, for publication in Physics Bulletin commemorative issues, 1974.
- G.29 Ms. drafts and additions.  
Editorial correspondence.
- G.30 2 typescript drafts, with different ms. corrections, September 1973.
- G.31, G.32 Shorter notes, narratives and background material for work on the history of electron diffraction.

History of physics and physicists

G.33-G.116 OBITUARIES, LECTURES AND WRITINGS ON PHYSICISTS

- G.33 E.V. Appleton  
1 p. general note on Appleton's work, n.d.  
1 p. note on 'Appleton's Lecture' (the first Granada Lecture on 'Communications in the Modern World'), October 1959.
- G.34 F.W. Aston  
'Statement of claim of Dr. Aston for the Royal Medal' (awarded 1938).  
Thomson's obituary of Aston, for Nature, 157, March 1946.  
Typescript draft with ms. corrections, copy of published version.
- G.35 M. Blackman  
Vote of thanks, 1 p. ms., 1960.
- G.36-G.42 N. Bohr
- G.36 'A statement of the claims of Professor Niels Bohr for the Copley Medal' (of the Royal Society).
- G.37 Greetings for Bohr's 70th birthday, for publication in Copenhagen Daily newspaper.
- G.38-G.41 Niels Bohr Memorial Lecture. Given in Manchester, 1964, and published in Chemical Society Proceedings.
- G.38 Ms. drafts.
- G.39 2 typescript drafts with ms. corrections and additions.
- G.40 Proof for published version, with ms. corrections and additions.
- G.41 Background material and notes. Includes obituaries of Bohr, 1 p. note from Lady Darwin on 'Niels Bohr's passage through London in 1943', extracts from draft of M.M. Gowing: 'Britain and Atomic Energy', annotated by Thomson.
- G.42 Review of 'Niels Bohr', ed. S. Rozenthal (for Contemporary Physics), 1967.  
Ms. notes and draft.  
Typescript version.

History of physics and physicists

G.43-G.51 W.L. Bragg

- G.43 Speech at presentation of Honorary Fellowship, Institute of Physics, to Bragg, December 1958.  
1 p. ms.
- G.44 Speech at presentation during celebration of 50th Anniversary of Bragg's Nobel Prize, held at Royal Institution, October 1965.  
3 pp. notes, programme of events.
- G.45, G.46 Memorial notice of Bragg for Annual Record of Trinity College, Cambridge, 1971.
- G.45 Ms. notes and draft.
- G.46 Typescript version with ms. corrections.  
Editorial correspondence.
- G.47-G.51 Address at Memorial Service for Bragg, September 1971.
- G.47 Ms. drafts.
- G.48 3 typescript versions, all with ms. corrections.
- G.49 Correspondence with Lady Bragg (including recollections and information, Order of Service).
- G.50 Correspondence with Mrs. A. Caroe (Bragg's sister) (including recollections and information).
- Correspondence with S. Bragg (son).
- G.51 Background material and published tributes to Bragg.
- G.52 S. Chapman  
1 p. ms. recollections, for Chapman's 80th birthday presentation volume.

History of physics and physicists

## G.53-G.74 Cherwell, Viscount (F.A. Lindemann)

Correspondence, recollections, reports and other information collected by Thomson, mainly from colleagues, when writing the Memoir of Cherwell for the Royal Society (published in Biographical Memoirs of Fellows of The Royal Society, 4, 1958).

The material, not all of which was used in the published work, is presented in alphabetical order of correspondent, with a short note on any information of particular interest.

A few items pre-date the writing of the Memoir, and some of the correspondence continues after that date.

- |      |  |         |
|------|--|---------|
| G.53 | C. Babington Smith<br>On 'spinning flight'.  | 1959    |
| G.54 | Birkenhead<br>On 'spinning flight' and other matters arising from Birkenhead's biography of Cherwell 'The Prof in Two Worlds', 1961.   | 1958-62 |
| G.55 | B. Bleaney   | 1958-59 |
| G.56 | A.A.D. Montague Browne   | 1957    |
| G.57 | D.M.B. Butt<br>Includes recollections of Cherwell's Statistical Branch 1940-42, some annotated by Thomson for quotation, and comments on draft <u>Memoir</u> .   | 1957-58 |
| G.58 | E.J.S. Clarke<br>Includes recollections of Cherwell's wartime activities.  | 1958    |
| G.59 | G.M.B. Dobson  | 1958    |
| G.60 | W.S. Farren<br>On 'spinning flight'; includes a substantial account by Farren of Cherwell's work in aerodynamics of which only part was used in the <u>Memoir</u> .<br><br>See G.83-G.94 for Thomson's obituary of Farren. | 1957-48 |
| G.61 | C.F. Goodeve   | 1958    |

History of physics and physicists

- |      |                     |            |  |
|------|---------------------|------------|--|
| G.62 | R.F. Harrod         | 1958-61    | Includes various recollections of Cherwell, and controversy about 'spinning flight', and the chronology of Cherwell's experiments on spin. |
| G.63 | H.B. Hartley        | 1961       |  |
|      | J. Harvey           | 1958       |  |
| G.64 | H.L. Ismay          | 1957-58    | Includes Ismay's comments on draft <u>Memoir</u> .   |
| G.65 | M.R. Jefferis       | 1957-58    | Includes recollections.  |
|      | B.M. Jones          | 1957       | Includes recollections.  |
| G.66 | R.V. Jones          | 1957-58    | Includes bibliography, Jones's obituary of Cherwell, correspondence on V2.   |
| G.67 | T.C. Keeley         | 1957-58    |  |
| G.68 | C.L. Lindemann      | 1957-58    | Includes early recollections.  |
|      | G.D.A. Macdougall   | 1957, 1959 | Includes offprint on Statistical Section.  |
| G.69 | E.A. Moelwyn-Hughes | 1958       |  |
|      | M. O'Gorman         | 1953       | On an earlier discussion of Cherwell's work.   |
| G.70 | A.G. Pugsley        | 1958       |  |
|      | J.A. Ratcliffe      | 1958       | Thomson's carbon only.   |
|      | E.A.G. Robinson     | 1959       |  |
| G.71 | P.J. Searby         | 1957-58    | Includes recollections of Cherwell's later political career.   |

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- G.72 G.I. Taylor 1957
- G.73 H.T. Tizard 1958  
On Committee for Scientific Survey of Air Defence  
and Air Defence Research Committee.
- G.74 Thomson's notes and plans for Memoir.  
Press-cuttings.  
Offprint of published Memoir.
- G.75-G.77 J.D. Cockcroft
- G.75 'Statement of the claims of Dr. J.D. Cockcroft for  
the Hughes Medal' (of the Royal Society), n.d.
- G.76 Biographical note on Cockcroft, 1952.  
Ms. and typescript versions.
- G.77 Obituary of Cockcroft, for Physics Bulletin, November 1967.  
Ms. and typescript versions.  
Proof with ms. corrections.  
Correspondence with Lady Cockcroft, and with  
Chadwick supplying a correction for the obituary;  
the correction appeared in Physics Bulletin, January  
1968.
- G.78 A.H. Compton  
'A.H. Compton at Cambridge'.  
Ms. drafts and notes, n.d. but perhaps written for  
talk after Compton's death in 1962.
- G.79 C.J. Davisson  
Obituary notice for Nature, 1958.  
2 pp. ms.  
Correspondence with colleagues re Davisson, and  
biographical information.
- G.80 L. de Broglie  
'Applications of Wave Mechanics'.  
Thomson's contribution to 60th Birthday Volume  
for de Broglie.

History of physics and physicists

- G.81 A.S. Eve  
Obituary notice, 3 pp., 1948  
See also J.29.
- G.82 M. Faraday  
Ms. notes for a talk on Faraday, n.d.
- G.83-G.94 W.S. Farren  
Correspondence, recollections and information collected by Thomson when writing, in collaboration with A.A. Hall, the Memoir of Farren for the Royal Society (published in Biographical Memoirs of Fellows of the Royal Society, 17, 1971).  
Notes, drafts and revisions for Memoir.
- G.83 A.R. Collar 1970-71
- G.84 P. Dykes 1971
- M.A. Farren 1970-72
- G.85 R.W. Gandy 1970
- S.B. Gates 1970-71  
Includes 8 pp. recollections of Farren of which only extracts appeared in Memoir.
- G.86 A.A. Hall 1970-72  
Thomson's collaborator on Memoir. Includes various drafts and sections for insertion.
- G.87 A. Haslam 1970  
Includes recollections.
- J. Lloyd 1970
- G.88 D. Maull n.d.
- M.B. Morgan 1970  
Includes recollections, and details of Farren's piloting activities 1941-45.
- G.89 Royal Society 1970-71  
Brief correspondence re Memoir.
- N.B. Surrey n.d.

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G.90 G.I. Taylor 1970

G.Trevelyan 1971

Trinity College, Cambridge 1970

G.91 Thomson's notes, ms. and typescript drafts.

G.92 Typescript with corrections by Thomson and Hall,  
May 1971.

G.93 Typescript with corrections by Thomson and by  
printer, 1971.

G.94 Proof with ms. corrections.

E. Fermi See J.31

G.95 O.R. Frisch  
Introductory remarks for a lecture by Frisch 'From  
Radioactivity to Nuclear Energy', November 1969.

G.96 P. Langevin  
Notes and ms. for contribution to Langevin Memorial  
Meeting, May 1947.

G.97, G.98 O. Lodge  
Contribution to a centenary programme 'Sir Oliver  
Lodge. An Impression of his Life and Work', broadcast  
on BBC Midland Home Service, June 1951.

G.97 Correspondence re programme.  
Ms. and typescript versions of Thomson's remarks.

G.98 Full transcript of programme.

G.99, G.100 A.C.B. Lovell

G.99 Introductory remarks for lecture by Lovell at Common-  
wealth Society, February 1960.

G.100 Recommendation of Lovell and M. Ryle for Nobel Prize  
in Physics, 1969, with correspondence.

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- G.101 J. Clerk Maxwell  
Review of 'Progress of a genius', 2 Vol. edition of Maxwell's papers, n.d.  
14 pp. typescript talk on Maxwell, given at Aberdeen and Edinburgh Academy, August 1961.
- G.102 I. Newton  
Article for Encyclopaedia 'Knowledge', October 1961.
- G.103 A.O. Rankine  
Offprint from Biographical Memoirs of Fellows of the Royal Society, 2, 1956.
- G.104 Rayleigh  
2 short accounts of Rayleigh, one prepared for Magdalene College, Cambridge, 1943.
- G.105 S. Rosenblum  
Review of edition of Rosenblum's papers, n.d.
- G.106-G.110 Rutherford
- G.106 'Rutherford'.  
3 pp. typescript account, with a note 'Paris 4.11.47.'
- G.107-G.109 'Rutherford in 19th Century Cambridge'.  
Notes and drafts for the Rutherford Lecture given in New Zealand in 1964, published in Transactions of the Royal Society of New Zealand, 1, August 1965, and in Proc. Roy. Soc. A.
- G.107 Thomson's ms. notes.  
Ms. draft of lecture.
- G.108 2 typescript drafts, with ms. additions and corrections.
- G.109 Offprint of New Zealand publication.  
Proof of London publication, with ms. corrections.

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G.110 Article for A Biographical Dictionary of Scientists,  
1966.

Ms. and typescript versions.

Correspondence with editor, T.I. Williams.

Book review.

E.N. da C. Andrade: 'Rutherford and the Nature  
of the Atom', 1967.

For Nature.

Ms. and typescript versions.

M. Ryle

see A.C.B. Lovell

G.111 G.F.C. Searle

Offprint from Biographical Memoirs of Fellows of the  
Royal Society, 1, 1955.

G.112, G.113 C.P. Snow

G.112 Review of Snow's 'Science and Government', 1961.

Correspondence re book with H.B. Hartley

G.113 Review of Snow's 'Varieties of Men', 1967.

For The Sunday Telegraph.

J.J. Thomson

For various accounts by Thomson of his father and  
his work, see the collection of J.J. Thomson  
(CSAC no. 74/4/80) in the Library of Trinity  
College, Cambridge.

See also J.25.

G.114 V.M. Turnbull

Obituary notice for the Perse School, Cambridge, where  
Turnbull had been Thomson's mathematics master.

G.115 C.T.R. Wilson

Obituary notice, 1959, probably for Physics Bulletin.

G.116 Young

2 pp. ms. speech.

SECTION H                      SCIENCE-RELATED INTERESTS    H.1 - H.161

- H.1 -H.40    Aims and methods of science
- H.41 -H.78    Science and society
- H.79 -H.91    Science and education
- H.92 -H.98    Science and war
- H.99 -H.111    Science and religion
- H.112-H.125    Chance and predictability
- H.126-H.159    Euthanasia
- H.160, H.161    Shorter talks.

The material in this Section includes notes, lectures, broadcasts and publications, and a little related correspondence.

There is inevitably some overlap with material assigned to other Sections, e.g., F.150 - F.209 on the effects of nuclear and thermonuclear power.

The main criterion is that Section H contains the reflections of a non-professional on fields of activity affected by developments in his own profession.

Thomson was always interested in the wider aspects of science. Some of the talks on the purposes and methods of science, and of its relation with religion, appear to date from the late 1920s or early 1930s; his lectures in America and Canada, 1929-30, are known to have included a talk on the philosophical implications of the recent discoveries in physics.

The surviving material represents two main strands in Thomson's thinking. One of these is concerned with the practical aspects of science, its impact on society, its funding and guidance, its relations with government institutions, its influence on individual lives in peace and war. His book 'The foreseeable future' (1955, widely translated) is the best known summation of these ideas, but the entries below indicate the number and also the time-span of his writings and lectures on similar topics.

Science-related interests

The second aspect relates to abstract and philosophical concepts. From general discussion of scientific and religious criteria of truth and choice, Thomson was led to examine determinism in human affairs, and randomness and predictability in the human brain. Much of his later work is concerned with these matters.

The two threads may be said to come together in Thomson's work for the Voluntary Euthanasia Society. Here he seems to have felt that for both sociological and philosophical reasons an individual may, and should, exercise the power of choice over his life. Thomson gave much attention to this in his later years, and planned an extended work on the subject (H.126 - H.138), left unpublished at his death.

Science-related interests

- H.1 - H.40      AIMS AND METHODS OF SCIENCE
- H.1      Early writings, n.d.  
            'Lucretius', 4 pp. ms.  
            'Method of Science', 1 p. ms.  
            'Aims and Methods of Physical Science', 4 pp. ms.
- H.2      'Aims and Methods of Physics', given to 'Math and Phys.  
            Soc.', October 1938.  
            3 pp. ms.
- H.3      Book reviews, 1950.  
            W.I.B. Beveridge: 'The Art of Scientific Investigation'.  
            G. Burniston Brown: 'Science, its Method and its  
            Philosophy'.
- H.4      'Nature of a Law of Nature'.  
            Given at Southampton, October 1951  
            2 ms. drafts and typescript version.
- H.5      Ms. notes for shorter talks.  
            'What is a Law of Nature?', 1951-52, 1 p.  
            'Law of Nature', 1 p. on verso of programme  
            for Thomson's visit to Lahore, 1952.
- H.6      'Mass Production in Nature'.  
            Lecture at Leicester College of Technology and Commerce,  
            January 1952.  
            Ms. and typescript versions.  
            Letter of thanks for lecture.
- H.7      'Why Physics?'  
            Talk at Imperial College, c.1952, 6 pp.  
            'Why Physics?'  
            Talk at Cambridge, October 1952, 1 p.

Science-related interests

- H.8 'Some Aspects of Science'.  
Talk at Working Mens College, n.d., 6 pp.  
(Uses similar material.)  
  
'Why do we do Physics?'  
Talk at Cavendish Laboratory, October 1953, 2 pp.
- H.9 Two talks at Lisbon, March 1954.  
'What is physics and why do men study it?'  
'Why do men study physics?'
- H.10 Untitled "Broadcast, May 1955".  
On scientific truth, 2 pp.
- H.11 'The scientific mind'.  
7 pp. for broadcast on BBC General Overseas Programme,  
July 1958.
- H.12 'Why Physics?'  
Talk at Hughes Hall, Cambridge, May 1959.  
2 ms. and typescript drafts.  
  
Untitled notes for a talk on value and methods of research, n.d.
- H.13 'The nature of physics and its relation to other disciplines'.  
Lecture given for National Science Foundation Summer  
Institute, USA, July 1959.  
2 pp. ms. draft.  
14 pp. typescript version.
- H.14 2 pp. ms. draft for talk on similar subject.
- H.15 Broadcast in BBC Woman's Hour, February 1960.  
A 3pp. talk on the aims of science.
- H.16 Comment for The New Scientist on an article by F. Hoyle  
(on the cost/value of research), August 1960.

Science-related interests

- H.17-H.19      Speeches and addresses at Annual Meeting of British Association for the Advancement of Science, Cardiff, 1960. (Thomson's Presidential Year.)
- H.17            'The two aspects of science'.  
Presidential Address.  
Ms. draft.  
Typescript version with ms. corrections.  
'Condensed version for B.B.C.'
- H.18            Miscellaneous speeches and introductory remarks given at various functions during the Cardiff meeting. 6 items.
- H.19            Speech on nomination as President (January 1960), speech at Birmingham to local B.A. (March 1960), speech at Cardiff, 1961.
- H.20            'The Inspiration of Science', O.U.P., 1961.  
Typescript with ms. corrections, in Thomson's folder labelled 'This copy exactly as sent to O.U.P. including numbering of pages'.
- H.21            'The Inspiration of Science'.  
13 pp. typescript and ms. lecture + 1 p. summary, given to National Research Council, Ottawa, September 1961, and elsewhere.
- H.22            Two similar talks.  
'The Inspiration of Science', given to 'Cosmos Club', Washington D.C., September 1961. 4 pp. ms.  
'Inspiration of Science', given to Rice University, October 1962. 7 pp. ms.
- H.23            'How does physics go to work?'  
Lecture at St. Louis, October 1961.  
Ms. drafts.  
Typescript with ms. corrections and additions.  
Similar lecture with some ms. variants, headed 'Given at Bangor, Feb. 1964'.
- H.24            'The importance of useless science'.  
Lecture in USA, 1961.  
10 pp. typescript and ms. draft, and diagram.

Science-related interests

- H.25 'Speech at Balliol Conference' (Oxford), September 1963  
(on purposes of research).
- H.26 'Productivity in research in universities'.  
Contribution to Symposium organised by Institution of  
Chemical Engineers, November 1963.  
Typescript draft.  
Ms. notes.  
Correspondence, 1962-63, with organisers.
- H.27, H.28 Two lectures (nos. 1 and 3 of a series) given at University  
of Malta, November 1963. For lecture 2, see H.34.
- H.27 'The two aspects of science', 13 pp.
- H.28 'How does physics go to work?', 9 pp.
- H.29, H.30 'Research in theory and practice'.  
The Inaugural Sir Henry Tizard Memorial Lecture, given at  
Westminster School, February 1963.
- H.29 Correspondence preceding and following lecture 1962-63.  
List of guests.
- H.30 Offprint and proof of published version.
- H.31 'Some thoughts on the scientific method'.  
Paper presented at the Boston Colloquium for the Philosophy  
of Science, May 1963, and published in Boston Studies in  
the Philosophy of Science, Vol.2, 1965.  
4 pp. ms. notes.  
Typescript and ms. draft, 12 pp.  
Offprint of published paper.

Science-related interests

- H.32 'Science. The Great Adventure'.  
The John Findley Green Lectures at Westminster College,  
Fulton, Missouri, March 1964.  
This was a course of three lectures, partly based on earlier  
material, with the following titles:  
    'Science as a Social Force'  
    'Science as a Flowering of the Intellect'  
    'Science the Mother of Technology'  
The lectures were published by Westminster College,  
44 pp., n.d.  
    Ms. and typescript drafts and notes.  
    Poster for lecture series.  
    Published version.
- H.33-H.36 'What is science trying to do, and why?'  
    Ms. and typescript drafts.  
This lecture, with some variations of title, was given at  
several times and places by Thomson, 1961-64.  
It formed the substance of a Ferguson lecture given at  
Washington University, 1961 (H.33), and of the second of  
his lectures at the University of Malta, 1963 (H.34, see also  
H.27, H.28). It was given in New Zealand and in Bangor  
1964 (H.35), and at a meeting of the British Association  
in Sheffield, n.d. (H.36).
- H.37 Miscellaneous notes and narratives on aims and methods  
of science, for lectures at Malta and later.
- H.38 'How are discoveries made?'  
    Short typescript notes for lecture.
- H.39 5 pp. ms. notes on 'Science a search for truth', November  
1965.
- H.40 4 pp. ms. notes for talk on 'Pure and Applied Science'.

Science-related interests

- H.41-H.78 SCIENCE AND SOCIETY
- H.41 Book review.  
R. Calder: 'Profile of Science' and  
J. L. Synge: 'Science Sense and Nonsense'  
For New Statesman and Nation, May 1951.
- H.42 'The new age of discovery and its limits'.  
1 p. ms. notes for talk at 'St. Catherines',  
February 1954.
- H.43 'Government Science'.  
4 pp. draft for talk to Scientists Lunch Club,  
Cambridge, November 1954.
- H.44-H.47 'The foreseeable future' (C.U.P., 1955).  
Notes, calculations and correspondence for various  
chapters of the book.
- H.44 Thomson's plan for book and designation of chapters.  
Notes and calculations for Chapter II - Energy and Power.
- H.45 Notes, calculations, correspondence for Chapter III -  
Materials.
- H.46 Notes, calculations, correspondence for Chapter IV -  
Aeroplanes, Submarines, Space Travel.
- H.47 Notes for Chapter V - Meteorology  
Chapter VI - Food and population  
Chapter VIII - Social consequences  
Chapter IX - Artificial Thought
- H.48 Shorter talks, 1955.  
'Some possible technical advances', University  
College, January 1955.  
Similar talk, Leicester, no title or date.
- H.49 'Some possible technical advances'.  
The Robert Boyle Memorial Lecture, to Oxford University  
Scientific Club, 1955.  
Ms. notes and drafts.

Science-related interests

- H.50 'The Next Fifty years of Power'.  
Article for Ingot, January 1956.  
5 pp. typescript and ms.
- H.51 'The foreseeable future'.  
Talk at Greenwich, February 1956.  
5 pp. typescript and ms.  
Notes attached for later talks at Greenwich, 1958.
- H.52 'The Impact of science on modern life - the new industrial revolution'.  
Lecture given at Cavendish Laboratory, March 1956.  
13 pp. typescript and ms.  
Thomson used this lecture as a basis for other papers and articles. See H.55.
- H.53 Contribution to BBC European Service Series 'The World in the Future', March 1956.
- H.54 'Future of Technology'.  
Brief notes for talk to Council for Foreign Relations, Philadelphia, April 1956.
- H.55 'The Impact of science on modern life'.  
A revised version of H.52, given at Oklahoma, Bell Telephone Laboratories and University of Maryland, April 1956, Imperial College, May 1956, and submitted July 1956 for publication in Bulletin of the Atomic Scientists, January 1957.  
Includes brief editorial correspondence.
- H.56 'Science and the future'.  
Preface to Readers' Union edition of 'The foreseeable future', December 1956.
- H.57 'Man may land on the moon a few years hence'.  
Article for The New Scientist, October 1957.  
Draft, proof, brief editorial correspondence.
- H.58 'A Journey to the Moon'.  
Article for The Star, October 1957.  
Draft, brief editorial correspondence.

Science-related interests

- H.59           Speech at opening of Computer Laboratory, University of Durham, January 1958.  
                  Invitation, programme of events, ms. notes, draft of speech.
- H.60           'Science in the modern world'.  
                  Notes and draft for talk at Balls Park Training College.
- H.61           Typescript interview with Thomson for Reuters, March 1958.
- H.62           Ms. notes for three talks on future sources of power, given in various places in America, April 1958.
- H.63           Untitled lecture, 4 pp. ms., October 1958.
- H.64           Book review.  
                  M. Pyke: 'Slaves unaware'.  
                  For New Statesman, May 1959.
- H.65           'Scientific possibilities'.  
                  Lecture at Greenwich, June 1959.  
                  4 pp. notes.
- H.66           'Some hopes and fears'.  
                  Talk at A.E.I. Staff Training Course, July 1959.  
                  Invitation, ms. and typescript drafts.
- H.67           'Future of Mankind'.  
                  Lecture at Imperial Defence College, December 1959.  
                  Correspondence re arrangements, draft.
- H.68           'Some possible scientific applications of the near future'.  
                  Article for The Stock Exchange Gazette, August 1960.  
                  Invitation, typescript draft.
- H.69           'Sources of Energy'.  
                  Broadcast, November 1960.  
                  2 typescript and ms. drafts, slightly different versions.

Science-related interests

- H.70 'Scientific possibilities'.  
Lecture at Greenwich, July 1961.  
Ms. notes, background material.  
There is a ms. note 'Some pages removed. See "Belfast Notes"' (H.71 below).
- H.71 'Belfast. Foreseeable Future'.  
Miscellaneous ms. notes, n.d., including some pages removed from H.70.
- H.72 'Physical Science in the Modern World'.  
Lecture given at Omaha and Kansas, 1961.  
Typescript and ms. draft.
- H.73 'Scientific possibilities'.  
Goldsmiths' College Oration, March 1962.  
12 pp. typescript and ms. draft.
- H.74 Book review.  
R. Watson-Watt: 'Man's Means to his End'.  
For New Scientist, November 1962.
- H.75 'Britain in 1984'.  
Article for a series with this title, published in New Scientist, 1964.  
Editorial correspondence, 2 versions of article.
- H.76 'Hopes and Fears'.  
3 pp. draft of talk planned for Lancing College, but eventually not delivered.  
Includes correspondence.
- H.77 'One Europe: is it possible?'.  
Talk on BBC European Service, April 1966.  
4 pp. typescript and ms.
- H.78 Foreword to book by R.W. Prehoda, October 1966.  
Ms. draft, and typescript version.

Science-related interests

- H.79-H.91      SCIENCE AND EDUCATION
- H.79      Two short talks on British Universities, one given in Washington, April 1948.
- H.80      Speech at Norwich School, July 1955.  
            Invitation, draft of speech.
- H.81      'Leicester. Thoughts on Research', November 1957.  
            1 p. ms. notes.
- H.82      Article for The Spectator on the proposed new 'Principles of Science' Tripos at Cambridge University.  
            Invitation, ms. draft of article.  
            Letter of comment by N.F. Mott, and amended version.
- H.83      'The Education of Scientists and Technologists, today and tomorrow'.  
            The Arthur Mellows Memorial Lecture, given at Peterborough, October 1957, and published 1958.  
            13 pp. typescript and ms.  
            Another lecture, 'The Shortage of Scientists' with a ms. note 'Peterborough'.  
            9 pp. typescript.
- H.84      Address to Sondes Park Research Institute, July 1958.  
            Untitled talk on sponsored research.
- H.85      'Physics and physicists in industry'.  
            12 pp. typescript for talk to electrical engineers, n.d., c.1958.
- H.86      Talk (on scientific publications) to Electrical and Allied Industries Research Association, May 1959.  
            5 pp. typescript and ms.

Science-related interests

- H.87 'Problems of Specialisation'.  
Talk to American Chemical Society, Chicago, January 1961.  
6 pp. typescript and ms.
- H.88 Talk at Technical Training Week Exhibition, Newmarket,  
May 1961.
- H.89 Talk at Ursinus College, June 1963.  
Ms. and typescript.
- H.90 Ms. draft for paper or talk on allocation of research  
funds, n.d.
- H.91 Shorter talks to schools and schoolmasters. Various  
dates, 1952-60.

Science-related interests

- H.92-H.98      SCIENCE AND WAR
- H.92-H.94      Lectures in Canada during Second World War, 1941-42.
- H.92            'British Science in War Time'.  
Given at Canadian Institute of Surveying.  
1 p. notes.  
5 pp. typescript and ms. draft.
- H.93            'The Scientific Attitude in Peace and War'.  
Ms. notes and draft.  
5 pp. typescript and ms. version.
- H.94            'Science and War'.  
1 p. ms. draft, n.d.
- H.95            'Science and War'.  
Talk given in America, December 1946.  
3 pp. ms.
- H.96            'The just objectives of war'.  
Ms. and typescript versions, n.d.
- H.97            'The uses of science and scientists in war'.  
Lecture at Sandhurst, March 1962.  
8 pp. typescript and ms.
- H.98            'War as it looks to a scientist'.  
Talk at Shrivenham, February 1966.  
8 pp. typescript and ms.

Science-related interests

- H.99-H.111      SCIENCE AND RELIGION
- H.99              Early undated talks, c.1930s.  
                    'Free will in physics'  
                    'Miracles'  
                    'Religion as applied science'
- H.100             Undated talks.  
                    'The Emotional Basis of a State'  
                    'Providence'  
                    'Platitudes'
- H.101             'Science and Faith'  
                    Talk at Aberdeen, December 1945.  
  
                    'Faith and Reason'.  
                    Similar material, no date or place.
- H.102             'Determinism in Science'.  
  
                    The Joule Memorial Lecture, given to the Manchester  
                    Literary and Philosophical Society, 1948, and subsequently  
                    published in the Society's Memoirs and Proceedings.  
  
                    8 pp. notes.  
                    11 pp. typescript version.  
                    Letter from J. Thomson (son) enclosing comments and  
                    revisions.
- H.103             'Science and faith: the contribution of science'.  
                    Talk at Aberdeen, April 1953, as part of the last Rector's  
                    debate.  
  
                    Heavily corrected and annotated 8 pp. typescript draft.  
                    Press-cutting, letter of thanks.
- H.104             Lecture on science and religion, given at Great St. Mary's,  
                    Cambridge, February 1957.  
  
                    2 typescript drafts with various ms. corrections and  
                    additions.

Science-related interests

- H.105 'Truth in science and religion'.  
Talk at Kelham, February 1959.  
Typescript drafts, incorporating some of the material in H.104.
- H.106 'Westminster Science and Religion Conference', June 1961.  
Ms. notes for contribution.  
  
'The ordinary man in church', May 1962.  
Ms. draft, probably for sermon at Corpus Christi College, Cambridge.
- H.107-H.109 'Determinism in Science'.  
Paper sent to Academia das Ciências de Lisboa, presented (in a Portuguese translation) at the meeting of the Academy in March 1964 and published (in English) in the Memorias.
- H.107 20 pp. ms. draft.
- H.108 2 typescript drafts with many ms. additions and corrections.
- H.109 Correspondence with President of Academy.  
Offprint of published paper.
- H.110 'Time-limited determinism in physical science'.  
3 ms. and typescript drafts, using similar material to H.107. One of the drafts has a note 'New Zealand 1964'.
- H.111 Book review.  
E. Schrödinger: 'My View of the World'.  
For British Journal for the Philosophy of Science, 1965.

Science-related interests

H.112-H.125 CHANCE AND PREDICTABILITY

The material consists of notes, calculations and some longer narratives and drafts on these subjects, and dates from Thomson's later years.

Many of the notebooks are used from both front and back and are of miscellaneous content. Most of the drafts are on loose pages torn from similar spiral-backed notebooks.

H.112 Spiral-backed notebook, labelled 'Prediction of Complex events'.

Drafts and calculations.

Includes 4 loose pages on subject.

H.113 Spiral-backed notebook, labelled 'Rate of loss of information. Miscellaneous'.

Notes, calculations, 11 pp. draft.

Includes (from rear of book) some reflections on religion.

H.114 Spiral-backed notebook, labelled 'Notes on Limits of Predictability'.

Notes and calculations.

H.115 Spiral-backed notebook.

From front: 3 pp. 'What do I believe?'

From back: drafts and loose pages, mainly on chance in scientific discovery.

H.116 Spiral-backed notebook.

Drafts and calculations on 'Is brain determinate?'

Both ends of book used.

H.117 'Is a human brain determinate? Draft two'.

8 pp. loose pages, continuation of above, on sheets torn from similar book.

H.118 Additional notes and drafts on determinacy of brain.

4 bundles.

H.119 'Prediction of Brain'.

7 pp. ms. draft + 1 p. Appendix.

Science-related interests

- H.120 Two ms. drafts on proof.  
'Proof', 3 pp.  
'Can proof be permanent?' 4 pp., c.1971.
- H.121 Three ms. drafts on chance, all on loose pages torn from spiral-bound notebooks.  
'Chance as a Cause', 16 pp. with many corrections and additions.  
'Chance', 3 pp.  
'Importance of Chance as a Cause', 1 p.
- H.122 Notes and calculations on a problem of randomness.  
Includes a letter on subject, 1966.
- H.123 Notes and drafts on 'Fluctuations' and 'Determinism'.
- H.124 Ms. and typed version of Thomson's letter to J.R. Lucas, setting out his views on determinism and brain mechanism, September 1971.
- H.125 'Time: for Tessa and Anne'.  
Ms. draft, 3 pp. typescript, c.1971.

Science-related interests

H.126-H.159 EUTHANASIA

Thomson was an active member of the Voluntary Euthanasia Society, and its Vice-President from 1970.

The material comprises Thomson's own writings and lectures on the subject, including his unpublished book 'Compassionate Death' (H.126 - H.138), correspondence and papers relating to the affairs of the Voluntary Euthanasia Society (H.139 - H.149) and to its proposed 'daughter' society the 'Life and Death Society' (H.150 - H.153). Minutes and circulars of the Voluntary Euthanasia Society, and general printed and background material have also been retained (H.154 - H.159).

The principal officers of the Society with whom correspondence is conducted are the Earl of Listowel (President), A.B. Downing (Chairman) and C.R. Sweetingham (Secretary).

H.126 'Right to die'.

Press-cutting of letter by Thomson in Daily Telegraph, November 1967, and ensuing correspondence.

'Voluntary Euthanasia'.

Ms. and typescript draft for talk at University of Warwick, October 1968.

H.127 Talk at discussion meeting, Institute of Advanced Legal Studies, London, March 1972.

Invitation, ms. draft.

H.128 'The problems of euthanasia'.

Article published (under the title 'The Euthanasia Debate') in Contact, Autumn 1972.

Ms. draft, editorial correspondence, copy of publication.

H.129 'Voluntary Euthanasia'.

Talk to Women's League, Unitarian Church, Cambridge, May 1973.

Invitation, ms. and typescript drafts.

H.130 Talk at Great St. Mary's, Cambridge, July 1973.

Invitation, ms. and typescript drafts (using similar material to H.129).

Science-related interests

H.131-H.138 'Compassionate Death'.

This is the title of a book of 24,000 words which Thomson wrote 1971-72, incorporating medical case histories, a note on the Raglan Bill, etc. The manuscript was offered to several publishers, but not accepted.

See also H.143.

H.131 First ms. drafts.

H.132 Typescript draft with ms. corrections. Lacks Appendix 3.

H.133 Material to be included as Appendices.

Line and word counts for various chapters and sections of book.

H.134 Miscellaneous ms. and typescript pages for re-drafting, or with comments added subsequently by Thomson.

H.135 Miscellaneous ms. notes by Thomson for book.

H.136 Correspondence with doctors, re contributions to be used or quoted in book (not indexed).

H.137 Articles, letters, personal recollections, etc., sent to Thomson as background material for book (not indexed).

H.138 Correspondence with publishing houses re book, 1972.

Cambridge University Press

Hospital Medicine

Pitman Publishing

Routledge

Victor Gollancz

H.139 Correspondence with Lord Listowel (President, Voluntary Euthanasia Society), 1970-73.

H.140 Correspondence with Lord Platt (mainly re debate in House of Lords), 1972-73.

H.141 Correspondence and papers re meetings of Voluntary Euthanasia Society with British Medical Association, and re 'Doctors and Euthanasia', the Society's rejoinder (April 1971) to the B.M.A. report 'The Problem of Euthanasia' (January 1971).

Includes various ms. and typescript drafts.

Science-related interests

- H.142 Correspondence and papers re proposed amendment of the Suicide Act (1961), 1971.
- H.143 Correspondence and papers, 1971-72, with officers of the Voluntary Euthanasia Society re Thomson's projected book.
- Includes initial suggestion for a publication made by Rupert Hart-Davis Limited.  
(not indexed)  
See also H.131-H.138.
- H.144 Ms. and printed material, mainly on medical ethics, 1973.  
Includes various drafts by Thomson on patients' rights, resuscitation practice, etc., and possible Parliamentary Bill.
- H.145 Correspondence and papers re suicide law in Scotland, 1973.
- H.146 Correspondence and papers re euthanasia societies and practices in USA, 1971-72.
- H.147 Correspondence and papers on euthanasia societies in Holland, with special reference to the report of the Dutch Reformed Church, April 1972, which was favourable to euthanasia.  
Includes Thomson's ms. and typescript summary of the report, and related newsletters, brochures, etc.
- H.148 Correspondence re visit of Dutch Reformed Church Delegation, October 1972.
- H.149 Miscellaneous correspondence re affairs of the Society, 1971-73.
- H.150-H.153 The Life and Death Society.  
This was to be a 'daughter' society of the Voluntary Euthanasia Society, its main purpose to be educational and the dissemination of information on patients' rights and the treatment of terminal illness.  
The material relates mainly to attempts to have the new society registered as a Charity, and includes reports, circulars, drafts and correspondence, emanating mainly from Thomson and officers of the Voluntary Euthanasia Society, solicitors and active supporters. The requirements of the Charity Commissioners for registration of the new society could not be met, and the project was abandoned.

Science-related interests

- H.150 November 1969-December 1970.
- H.151 December 1971-January 1972.
- H.152 May 1971-September 1971.  
Includes correspondence re supporters for new society.
- H.153 March-June 1972.
- H.154-H.158 Minutes and circulars of the Voluntary Euthanasia Society  
(some annotated by Thomson).
- H.154 Miscellaneous testimonies, statements, bibliographical  
information.
- H.155 Minutes and meetings 1970
- H.156 Minutes and meetings 1971
- H.157 Minutes and meetings 1972
- H.158 Minutes and meetings 1973
- H.159 Miscellaneous brochures, cuttings, transcripts, etc. relating  
to euthanasia.  
1 box.

Science-related interests

H.160	Shorter talks to societies and universities, 1950s.	
	'B.B.C.'	n.d.
	S.I.M.A. Electronics Group	n.d., c.1950
	Geographical Society	1952
	Engineering Society of the English Electric Co.	1955
	Institution of Gas Engineers	1958
	Society of Investment Analysts	1958
H.161	Shorter talks to societies and universities, 1960s.	
	Hilger and Watts	1960
	Institution of Electrical Engineers	1960
	Aberdeen	1964
	Consejo Superior de Investigaciones Cientificas	1964
	'Makers of Scientific Instruments'	1966
	St. Louis University Club	n.d.

SECTION J            CORRESPONDENCE J.1 - J.134

The main sequence of correspondence (J.1 - J.124) is presented alphabetically, dated, and with an indication of any material of particular scientific or biographical interest. Most of the correspondence is with individuals, but some societies and organisations are also included.

There are few very substantial exchanges and it is clear that there are considerable gaps in the material; in particular there is very little early correspondence on electron diffraction, and the only letter in the collection from J.J. Thomson is at C.3.

J.125 - J.134 consists of shorter correspondence, mostly unindexed.

J.1	Adam, N. K. Includes correspondence <u>re</u> electron diffraction.	1935, 1945
	Akers, W. A.	1948
	Allen, J. E.	1958
J.2	Andrade, E. N. da C. Includes draft by Andrade on 'The Hydrogen Bomb' and correspondence <u>re</u> his Rutherford Memorial Lecture.	1950, 1958
J.3	Appleton, E. V. Includes copy of letter from A.V. Hill <u>re</u> Scientific Register.	1939
	Archambault, B.	1943
	Armstrong, H. E.	1934
J.4	Bannister, F. A.	1935
	Barford, N. C.	1950
J.5	Bjerknes, V. Includes copies of letters from L. Brillouin and M. Brenot.	1938-39
	Blackett, P. M. S.	1933-34, 1948

Correspondence

J.6	Bohr, N.	1947, 1948
	Born, M.	1950, 1951
J.7	Bragg, W. H.	1933
	Bragg, W. L.	1935, 1937, 1956, 1958
J.8	British Association for the Advancement of Science Includes draft of 'Proposals of further co-ordination of scientific research in Great Britain' by J.D. Bernal and J.S. Huxley, with 2 pp. type- script comments by Thomson. (2 drafts)	1939
J.9	Brown, J. K. re Wirbelrohr accelerator.	1947
	Bruce, R. Enclosing photographs of experimental results.	1936
	Brunt, D. Includes letter from Sir Napier Shaw, February 1920.	1951
	Burgers, W. G.	1937
J.10	Cave, C. J. B. re radio carbon dating.	1950
	Chadwick, J. Includes letter re cyclotron.	1934, 1938
J.11	Chapman, S. Includes copies of brief letters from C.C. Paterson and W.S. Tucker.	1937
	Chaudhri, R. M.	1957-58
J.12	Cherwell, Lord (F.A. Lindemann)	1958
	Cockcroft, J.D. (Thomson's carbons only) re cyclotron.	1938
J.13-J.17	Committee on Science and Freedom. Correspondence with M. Polanyi (Chairman), G. Polanyi and P. Polanyi (Secretaries). The sequence includes copies of various letters sent to the Press by the Committee, and some reports on the Committee's activities (Thomson was a sponsor).	1954-62.



Correspondence

- |      |   |  |
|------|---|--|
| J.24 | Dirac, P. A. M.   | 1930                                     |
|      | Dodds, E. M.  | 1937                                     |
| J.25 | Editions d'Art Lucien Mazenod.<br>Correspondence with L. Leprince-Ringuet and<br>L. Mazenod <u>re</u> biographical article on J.J.<br>Thomson written by Thomson for publication in<br>a book entitled 'Les Inventeurs Célèbres'.<br>Folder also includes ms. and typescript drafts of article. | 1949-50                                  |
| J.26 | Ehrenhaft, F.   | 1949-50                                  |
| J.27 | Eldridge, R. H.<br><u>re</u> artificial control of weather.   | 1950                                     |
|      | Ellis, C. D.<br><u>re</u> electron diffraction experiment.  | 1931                                     |
| J.28 | Emeleus, K. G.<br>Includes typescript of paper by Emeleus on<br>plasma electron oscillations.   | 1950, 1958                               |
| J.29 | Evans, U. R.<br><u>re</u> electron diffraction.   | 1930                                     |
|      | Eve, F. C. <u>and</u> Eve, E.<br><u>re</u> Thomson's obituary of A.S. Eve.<br>See also G.81.  | 1948                                     |
| J.30 | Farnsworth, H. E.<br>Correspondence arising from Thomson's book on<br>'The Wave Mechanics of Free Electrons'.   | 1931-32                                  |
|      | Farren, W. S.<br><u>re</u> fluid dynamics.  | 1931                                     |
| J.31 | Ferguson, A.  | 1940 (Thomson's<br>carbon only),<br>1949 |
|      | Fermi, E.<br>(Thomson's carbons only). Includes copy of<br>letter from Thomson to the Nobel Committee for<br>Physics recommending Fermi for the Nobel Prize.  | 1934-35, 1938                            |

Correspondence

J.32	Finch, G. I. (Thomson's carbons only. Includes letter from Thomson to M. von Laue).	1937
	Fitzwilliam Museum, Cambridge Correspondence with the Director (C. Winter) <u>re</u> a portrait of J.J. Thomson in the Cavendish Laboratory.	1950-51
	Flint, H. T.	1950
J.33	Fowler, R. H. <u>re</u> experiments with semi-conductors.	1933
	Franck, J. Arrangements for Thomson to deliver a lecture at Göttingen.	1931
J.34	Frankland, P. F. <u>re</u> light effect on waves.	1931, 1932
	Fraser, R.	1934
	French, R. C.	n.d., 1934
J.35	Gabor, D. <u>re</u> plasma oscillations.	1934
J.36	Gaertner, H.	1935
	Geddes, A. E. M.	1937
	Gentner, W.	1951
J.37	Gerding, H. Arrangements for Thomson to deliver a series of lectures in Holland.	1933
	Gladwyn, Lord	1948
	Griffith, H. D.	1933, 1934
	Gruber, F.	1946
J.38	Halsbury, Earl of <u>re</u> solid state physics.	1957
J.39	Hankey, Lord <u>re</u> effects of nuclear explosions. Includes related printed matter, 1 p. ms. calculations by Thomson and copy of letter from J.D. Cockcroft.	1954
J.40	Haque, A.	1949

Correspondence

J.41	Hartley, H. B. Includes correspondence <u>re</u> J. J. Thomson.	1950, 1957
J.42	Hume-Rothery, W.  Imperial Chemical Industries Limited Correspondence with the Publicity Department <u>re</u> article on the Electron Microscope.	1948  1943

J.43-J.59	Imperial College, London Correspondence with and <u>re</u> members of Imperial College staff, arranged in alphabetical order. Most of the correspondence is <u>re</u> appointments, salaries, etc., but this is sometimes combined with accounts of work in progress or plans for future research. Some of the exchanges are with H. Dingle or L.C. Martin who stood in for Thomson during his periods of absence from Imperial College.	1935-50
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The names of all correspondents, with the exception of junior members of staff, are included in the Index of Correspondents.

J.43	A
J.44	Ba - Bl
J.45	Br - Bu
J.46	C
J.47	D
J.48	E - F
J.49	G
J.50	Ha
J.51	He - J
J.52	K
J.53	L
J.54	M
J.55	N

Correspondence

J.56 P  
J.57 S  
J.58 T  
J.59 V - W

J.60-J.66

Institute of Measurement and Control  
(formerly Society of Instrument Technology)

1948-74

Thomson was the first President of the Society which was founded in 1944. He was made an Honorary Member in 1955 (see J.61) and continued to keep in touch with the Society for many years. He delivered the first Thomson lecture in 1961 (see J.62) and was asked to have his name associated with a Gold Medal (J.65).

See A.28 for a Certificate of Membership of the Society, 1945.

See G.26-G.28 for an article written by Thomson for the Institute's Jubilee in 1969.

J.60

1948-51

Correspondence with Secretary re meetings, subscriptions, etc. Includes draft minutes of Council Meeting, 13 April 1949.

J.61

1955

Includes invitation from the President (A.J. Young) for Thomson to become an Honorary Member of the Society.

J.62

1961

Includes typescript of 'The Inspiration of Science', the first Thomson Lecture of the Society of Instrument Technology, delivered on 19 October 1961. The text of the lecture was published in Nature and in the Society's Transactions.

J.63

1962-67

Miscellaneous correspondence with President (L.B. Lambert) and Secretary.

Correspondence

- |      |  |                  |
|------|--|------------------|
| J.64 | 1968-73<br>Includes correspondence with the President (D.C. Nutting) <u>re</u> the Institute's petition for a Royal Charter.   |                  |
| J.65 | 1973-74<br>Correspondence with the Secretary. Includes request for permission to link Thomson's name with a Gold Medal to be awarded by the Society every five years.  |                  |
| J.66 | Printed matter and circulars, 1964-73.   |                  |
| J.67 | Institute of Marine Engineers  | 1957             |
|      | Institution of Electrical Engineers<br><u>re</u> portrait of J.J. Thomson to be hung in the Institution.   | 1947             |
|      | Ives, H. E.  | 1951             |
| J.68 | Jackson, C. V.<br>(Thomson's carbons only)<br><u>re</u> light helium experiment.   | 1935             |
|      | Jackson, H.  | 1932-33          |
|      | James, R. W.   | 1931             |
|      | Jeans, J. H.   | 1930             |
| J.69 | Jeffreys, H.   | n.d.             |
|      | Joliot-Curie, J. F.<br>(Thomson's carbon only)   | 1940             |
|      | Jones, R. V.   | 1946, 1967       |
| J.70 | Karlik, B.   | 1933, 1938, 1946 |
|      | King, R.W.<br>Includes copy of a letter from G.B. Pegram.  | 1936             |
| J.71 | Kirchner, F.<br><u>re</u> electron diffraction. Includes typescript draft with ms. corrections by Kirchner on 'Electron reflection on polycrystalline metal layers and surface structure of polished metals', July 1935. | 1930-35          |

Correspondence

J.72	Klemensiewicz, Z. <u>re</u> biography of M. Smoluchowski.	1957
	Kramers, H. Includes letter from J.D. Cockcroft.	1948
	Kudar, J. <u>re</u> hydrogen isotopes.	1950
J.73	Laue, M. von Much of the correspondence is <u>re</u> electron diffraction with an accompanying exchange of plates and photographs. Folder includes a letter from P.P. Ewald asking Thomson to review von Laue's book 'Materiwellen und ihre Interferenzen'.	1932-37, 1947-49
J.74	Ladenberg, R. (Thomson's carbon only)	1948
	Lebau, H.	1934
	Lees, C. S. <u>re</u> electron diffraction.	1933
J.75	Lin, H. (Thomson's carbon only)	1973
	Littlewood, J. E. <u>re</u> Thomson's obituary of F.W. Aston.	1945
J.76	Lodge, O.	1932
	Lowry, T. M. Enclosing photographs from H. Mark.	1930
	Lyman, T. <u>re</u> Thomson's book 'Wave Mechanics of Free Electrons'.	1930
J.77	Macdonald & Company (Publishers) Limited <u>re</u> Thomson's foreword to the English edition of R.A. Millikan's autobiography. Includes a letter of thanks from Millikan.	1951

Continued

Correspondence

- J.77 (Cont.d) McGraw-Hill Publishing Company Limited 1932, 1965  
re Thomson's book 'Wave Mechanics of Free  
Electrons', and a biographical article for  
'Encyclopaedia of Science and Technology'.
- McHenry, J. J. 1934
- J.78 McKerrow, G. 1934-39  
Includes correspondence re electron microscope  
built for Imperial College by Metropolitan-  
Vickers Electrical Co. Ltd., with the aid of a  
grant from the Royal Society.
- J.79 McLennan, J. C. 1935  
re experiments using radiothorium.
- McNaughton, A. G. L. 1948  
Enclosing text of broadcast on atomic energy,  
6 November 1948.
- J.80 Mann, W. B. 1936-37  
re experimental work at Imperial College and  
Berkeley, California. Includes several photo-  
graphs.
- J.81 Manson, J. M. 1943  
Enclosing 3 pp. typescript on exchange of  
scientific information between Britain and Canada.
- Mark, H. 1930
- J.82 Martin, L. C. 1936-50  
Includes several letters written from the University  
of Rochester, New York, where Martin was Visiting  
Professor, 1936-37. Correspondence is mainly  
re research and Imperial College affairs. Some  
of the exchanges are conducted with A. Rankine or  
H. Dingle, in Thomson's absence from Imperial  
College.
- J.83 Medical Research Council 1936-37  
Includes copies of reports on work done at  
Imperial College 1935, 1936 with radon from the  
Middlesex Hospital Centre.
- Mendenhall, C. E. 1933  
re thermal conductivity.

Correspondence

- |      |  |         |
|------|--|---------|
| J.84 | Ministry of Supply   | 1949    |
|      | Moon, P. B.<br>Includes typescript 'Summary of notes on lectures by E. Fermi', n.d., and 3 pp. ms. calculations.   | 1946    |
|      | Mott, N. F.  | 1948    |
|      | Munn, B. W.<br><u>re</u> atomic warfare.   | 1947    |
| J.85 | Norton Company<br><u>re</u> optical pericase.  | 1937    |
|      | Norway, N. S. (Nevil Shute)<br>Correspondence arising from Shute's book 'On the Beach'.  | 1957    |
|      | Nuffield Foundation  | 1950    |
| J.86 | Oliphant, M. L. E.   | 1934-35 |
|      | Osborn, F.   | 1948    |
|      | Otty, E. H.  | n.d.    |
| J.87 | Oxford University Press<br><u>re</u> preface by Thomson to Italian edition of his book 'The Atom'. Includes ms. draft of preface.                              | 1951    |
| J.88 | Paneth, F. A.  | 1934    |
|      | Parson, A. L.<br>Includes typescript entitled 'Explanation of the Photoelectric Effect without Wave-particle Dualism'.   | 1957    |
|      | Paterson, C. C.<br><u>re</u> supply of caesium photocell to Thomson's Laboratory.  | 1935-36 |
| J.89 | Peierls, R. E.<br><u>re</u> thermonuclear power.   | 1946    |
| J.90 | Popper, K. R.<br>Correspondence arising from an article by Popper on 'Quantum Mechanics without "The Observer"', a reprint of which is included in the folder. | 1967-68 |

Correspondence

- |       |  |               |
|-------|--|---------------|
| J.91  | Portal, Lord<br><u>re</u> atomic weapons and the balance of power.   | 1947          |
|       | Powell, C. F.<br>Enclosing abstract of a Discourse given by<br>Powell at the Royal Institution, 16 February 1951.  | 1951          |
|       | Przibbraun, K.   | 1933, 1950    |
| J.92  | Raether, H.  | 1947, 1951    |
|       | Read, S.   | 1946          |
| J.93  | Reimann, A. L.   | 1933-34       |
|       | Reynolds, P. W.  | 1935          |
| J.94  | Richtmyer, F. K.   | 1930          |
|       | Rickett, D. H.<br>(Thomson's carbon only)  | 1947          |
| J.95  | Rideal, E. K.  | 1948          |
| J.96  | Robertson, J. K.<br>Includes correspondence with A.C. Egerton.   | 1934, 1946-47 |
| J.97  | Robertson, R.<br><u>re</u> diamonds lent to Thomson for electron<br>diffraction experiments. Includes correspondence<br>with R. Beeching.  | 1933-35       |
| J.98  | Rotblat, J.<br><u>re</u> nuclear fission.  | 1955          |
|       | Royal Institution<br>Correspondence with the Librarian (K.D.C.<br>Vernon).   | 1962          |
| J.99  | Royal Society<br>1950 correspondence is <u>re</u> arrangements for<br>Thomson to attend the 10th Anniversary Cele-<br>brations of the Consejo Superior de Investigaciones<br>Cientificas in Madrid, 12-17 April. | 1948, 1950    |
| J.100 | Rupp, E.<br><u>re</u> electron diffraction experiments. Includes<br>correspondence with several others including<br>O.W. Richardson, Lord Rutherford, L. Szilard<br>and F. Simon.                                | 1928-35       |

Correspondence

- |       |   |                  |
|-------|---|------------------|
| J.101 | Russ, S.  | 1934, 1948       |
| J.102 | Rutherford, Lord<br>Includes correspondence with H.A. Ferreira.   | 1933, 1935-37    |
| J.103 | Ryle, M.<br>1960 correspondence is in response to a request from Thomson for information re radio astronomy in connection with a proposed lecture tour in USA. Folder includes letters from A.C.B. Lovell and H. Bondi, and some ms. notes and calculations by Thomson.   | 1957, 1960, n.d. |
| J.104 | Miscellaneous reprints on radio astronomy sent to Thomson by M. Ryle. (See J.92.)   |                  |
| J.105 | Rymer, T. B.  | 1957             |
|       | Schrödinger, E.<br>Includes correspondence re <u>Determinism</u> .  | 1945, 1949       |
| J.106 | 'Semaine Internationale Contre le Cancer'.<br>Correspondence re a lecture delivered by Thomson in Paris, 26 November 1938. Includes a letter from the Secretary of the Physical Society (W. Jevons) re Thomson's attendance at the Paris meeting as the Society's representative.<br><br>See F.80 for draft of Thomson's lecture. | 1938             |
| J.107 | Shaw, H. (Director, Science Museum)<br>Correspondence re Thomson's original electron diffraction camera which he lent to the Science Museum, along with some early photographs, for the Electron Jubilee Exhibition, 1948.  | 1947-49          |
| J.108 | Shenstone, A. G.  | 1950             |
|       | Simon, F. E.  | 1946, 1951       |
| J.109 | Slepian, J.<br>Includes correspondence with D. Gabor, and various drafts and reprints by Slepian.   | 1960, 1963       |

Correspondence

- |       |   |            |
|-------|---|------------|
| J.110 | Smith, M. S.<br><u>re</u> experiment performed by J.J. Thomson in 1897 to measure the specific charge of cathode rays.  | 1957       |
|       | Società Italiana di Fisica<br>Invitation to Congress (declined). Includes 2 letters from the British Council.   | 1950       |
|       | Straus-Negbauer, A. F.<br>Includes 2 letters from M. Planck and 1 from G.M. Schurhoff.  | 1939       |
| J.111 | Sulaiman, S.<br><u>re</u> theory of relativity. Includes copy of a letter from H. Dingle.   | 1934       |
| J.112 | Sutton, N.<br><u>re</u> investigations into crystal structure of protective films on metals. Includes typescript 'Report on protective coating acquired by magnesium alloy during chromate treatment', by R.O. Jenkins. | 1933-34    |
| J.113 | Szilard, L.<br>mainly <u>re</u> ordering of metallic beryllium from Siemens-Schukert. Folder also includes correspondence with the Academic Assistance Council <u>re</u> provision of research facilities for Szilard.  | 1934-35    |
| J.114 | Takamine, T.  | 1933       |
|       | Taylor, G. I.   | 1951       |
| J.115 | Thouless, R.  | 1950       |
|       | Tillman, J. R.  | 1947-48    |
| J.116 | Tizard, H. T.<br>Includes correspondence <u>re</u> dating of Chinese ceramics by electron diffraction, with a letter from A.L. Hetherington.  | 1935, 1957 |

Correspondence

- |       |  |   |
|-------|--|---|
| J.117 | <p>Trillat, J. J.<br/>(Thomson's carbons only)<br/>Includes a letter from J. Cates.</p> <p>Tull, V. F. G.</p> <p>Tumbull, H. W.<br/><u>re</u> letters of Isaac Newton.</p>   | <p>1936</p> <p>1950</p> <p>1949</p>             |
| J.118 | <p>UNESCO</p> <p>Usmani, I. H.</p> <p>Van der Graaf, R. J.<br/>(Thomson's carbon only)</p>   | <p>1959</p> <p>1944</p> <p>1949</p>             |
| J.119 | <p>Walker, P. K.<br/>(copy of letter from Thomson only)</p> <p>P.K. Walker was Fellow and Dean of Chapel at Corpus Christi College, 1958-62, and later Bishop of Ely. Thomson's letter was written in reply to one from Walker (not included here) enclosing a copy of his Hulsean Sermon to the University of Cambridge, and contains some interesting theological observations.</p> <p>The letter is included in the collection by kind permission of the Bishop of Ely.</p> | <p>n.d. (1967)</p>                              |
| J.120 | <p>Whyte, L. L.<br/><u>re</u> work of J.J. Thomson.</p> <p>Wierl, R.</p> <p>Williams, E. J.<br/>(Thomson's carbon only)</p> <p>Williams, R.<br/>Correspondence arising from Thomson's book 'The Foreseeable Future'.</p>   | <p>1951</p> <p>1930</p> <p>1931</p> <p>1955</p> |
| J.121 | <p>Wilson, A. H.<br/><u>re</u> ultimate strengths of fibres.</p> <p>Wimperis, H. E.<br/>1933 correspondence is <u>re</u> a request by Thomson for Mesothorium, and offers to send him four samples of luminous compound, then in possession of the Air Ministry. A copy of a report on the compounds by the National Physical Laboratory, September 1931, is enclosed with the letter.</p>   | <p>1954</p> <p>1933, 1947</p>                   |

Continued

Correspondence

- J.121 (Cont'd.)      The compounds, sent by Wimperis, were found with the letter when the Thomson collection was being sorted in 1980. They were mildly radioactive and were handed over to the Oxford University Radiation Protection Officer for disposal.
- 1947 correspondence is re world stocks of uranium.
- J.122      Wood, A.      1948  
re possible publication of a lecture by Wood on J.J. Thomson.
- Wooster, W. A.      1935  
re possible materials (gypsum, anthracene, cellophane, etc.) for use in neutron diffraction experiments.
- J.123      Wright, W. B.      1937  
Correspondence with A.O. Rankine re echo sounding.
- J.124      Zeeman, P.      1933
- Zuckerman, Lord      1958  
Includes copies of correspondence with Sir Charles Kingsley.

Correspondence

J.125-J.134	Shorter correspondence. The following correspondence is arranged in subject files and with the exception of J.125 is not indexed.	
J.125	Invitations to give talks, lectures, etc.	1946-51
J.126	Shorter correspondence with publishers and journals, mainly requests to write or referee articles.	1950-62
J.127	Requests to work in Thomson's laboratory.	1935, 1950
J.128	Brief letters enclosed with books, articles, dissertations sent to Thomson.	1939-67
J.129	Requests to quote or reproduce from articles by Thomson.	1950-72
J.130	Requests from individuals for references.	1934-51
J.131	Requests from institutions to examine theses or candidates.	1947-51
J.132	Miscellaneous shorter scientific correspondence, including invitations to conferences, etc.	1935-68
J.133	Miscellaneous personal correspondence.	1947-51
J.134	Correspondence with eccentrics and members of the general public.	1950-51

SECTION K

PLATES, SLIDES AND PHOTOGRAPHS K.1 - K.41

- K.1 Copies of G.P. Thomson's original sketches for his first electron diffraction apparatus. The whereabouts of the originals are not known.
- K.2 Wooden box containing 49 photographic plates, labelled 'First Diffraction Experiments, Sept. 12 1927-Nov. 22 1927. "X", Au, Pt, Al, Ag inclined'. A list of contents with a brief description of each plate is attached inside the lid of the box.
- K.3 Cardboard box containing 5 photographic plates, 1929-30, labelled as follows:
- 'Reflection 1929' (2)
  - 'Reflection pattern "3 rings" probably oxidised copper' (February 1930)
  - 'Reflection 1930' (2)
- K.4 Cardboard box (no lid) containing 14 photographic plates, 1931, labelled as follows:
- 'Copper single crystal' (January)
  - 'Single Crystal Reflection. Probably Copper' (January)
  - 'Single Crystal (Cu?) irregular cut reflection' (February)
  - 'Single Crystal Reflection. Probably silver' (February)
  - 'Copper (single crystal)' (February)
  - 'Copper single crystal' (February)
  - 'Single Crystal Reflection' (February)
  - 'Copper single crystal' (March)
  - 'Reflection' (April)
  - 'Reflection F.C.C. crystal' (May)
  - 'Reflection 1931' (October)
  - 'Reflection 1931' (November)
  - 'Reflection. Diamond' (December)
  - 'Reflection. Diamond' (December)

Plates, slides and photographs

- K.5                    Wooden cigar box containing 7 photographic plates, 1932-35, labelled as follows:
- |   |                      |
|---|----------------------|
| 'Reflection 1932'                       | (January)            |
| 'Reflection 1932 diffuse rings (Pt.?)'  | (February)           |
| 'Reflection 1932'                       | (June)               |
| 'Reflection 1932 (Perhaps NaCl)'        | (October)            |
| 'Platinum Transmission 1935'            | (March <u>1933</u> ) |
| 'Grease Pattern 1933'                   | (April)              |
| 'Silver polycrystalline reflection /35' | (March)              |
- K.6                    Cardboard box containing 14 photographic plates, undated, but labelled as follows:
- |                                |     |
|--------------------------------|-----|
| 'Gold Transmission Orientated' |     |
| 'Polished Gold (reflection)'   |     |
| 'Burnished gold reflection'    |     |
| 'Lead Oxide Transmission'      | (2) |
| 'Gold Transmission'            | (8) |
| Untitled                       |     |
- K.7                    Cardboard box labelled 'Copies and prints of two gold transmission pictures, Dec. 19 (1927). Also two slides (copies)'.  
  
K.8-K.11            4 boxes of slides illustrating electron diffraction, mostly made from Thomson's original glass plates.  
  
K.12                   Miscellaneous photographs, mainly of electron diffraction patterns. Some of these are mounted for reproduction in various publications, others are in envelopes labelled, and sometimes dated by Thomson, but many are loose with no indication as to their origin.

Plates, slides and photographs

- K.13-K.16 4 large wooden slide boxes, all with note of contents, as follows:
- K.13 'Ionisation by +<sup>ves</sup>  
Positive Rays  
Mass Spectra  
Crystals  
X rays' n.d., c.1935
- K.14 'Nuclear. Atomic Physics Box 3'.  
Slides inside labelled 'X-rays' and ' $\alpha$  rays'.
- K.15 'Cosmic Rays'.  
Slides inside mainly of mesons, latest date 1949.
- K.16 'Betatrons  
Raether on Rock Salt  
Electron Microscope'  
Inside of box lid bears similar labels, and a note that the Betatron slides were for lecture at Institute of Electrical Engineers. n.d.
- K.17-K.20 4 boxes of slides illustrating the history of electron diffraction.
- K.21, K.22 2 boxes of slides containing portraits of physicists.
- K.23 'Cavendish photographs'. 1 box containing slides of individual and group photographs of members of the Cavendish Laboratory.
- K.24-K.27 4 boxes of slides on thermonuclear power. Includes pictures of Zeta and Sceptre (see Section E).
- K.28 Slides on 'Davisson's and Kikuchi's work'. 1 box.
- K.29 'Slides of crystal growth oriented on substrate'. 1 box.
- K.30 'Plates of double tube camera circuit'. 1 box.
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