

Catalogue of the papers and correspondence of

**PHILIP BURTON MOON FRS**

(1907-1994)

Compiled by Timothy E. Powell and Peter Harper

Deposited in the Library,  
University of Birmingham

NCUACS 69/7/97

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## GENERAL INTRODUCTION

### PROVENANCE

The papers were received in July 1997 from the University of Birmingham Library. They comprise papers deposited with the University of Birmingham Library by Mr A.E. Moon, son, and further material assembled by Professor W.E. Burcham while preparing the Royal Society Biographical Memoir of Moon.

### OUTLINE OF THE CAREER OF PHILIP BURTON MOON

Philip Burton Moon was born on 17th May 1907 in Lewisham, London. He was educated at Leyton County High School before winning a scholarship to Sidney Sussex College Cambridge in 1925. He graduated from the Natural Sciences Tripos in 1928, having taken Physics in Part II. Moon went on to research in the Cavendish Laboratory, Cambridge under M.L.E. Oliphant. In 1931 Moon was appointed Assistant Lecturer at Imperial College, London (Lecturer from 1934). Working under G.P. Thomson he researched in neutron physics.

In 1938 Moon followed his former supervisor Oliphant to the University of Birmingham as Lecturer in the Department of Physics. They began to build up a school of nuclear physics using the Department's 60-inch cyclotron. On the outbreak of war the Department initially concentrated on the development of short-wave radar. In 1942 Moon was seconded to the British Scientific Central Office in Washington D.C. He returned to Birmingham later in the year but in 1943 went back to the USA to join the Manhattan project at Los Alamos working on the atomic bomb. After the war Oliphant and Moon resumed their work to build up research in nuclear physics at Birmingham. Cyclotron work begun before the war was continued and a proton synchrotron became operational in the early 1950s.

Moon was appointed Reader in 1943 and Professor in 1946. On Oliphant's move to the Australian National University at Canberra in 1950, Moon succeeded him in the Poynting Chair of Physics. He held this post until retirement in 1974. He was Head of Department of Physics until 1970 and Dean of the Faculty of Science and Engineering 1969-1972.

Moon made a number of important contributions to physics. The citation of Moon for the Royal Society Hughes Medal noted his work in three main areas: 'nuclear physics, the discovery of gamma-ray resonances, and the use of colliding molecular beams to study chemical reactions'. In the 1930s at Imperial College London, working with J.R. Tillman, he had demonstrated the existence of 'thermal' neutrons and during the war after work on radar he joined the 'Tube Alloys' project working on developing the atomic bomb. Returning to the University of Birmingham after the war Moon resumed work with the cyclotron and



saw the completion of the Proton Synchrotron, the first synchrotron of its type in the world to work at full power. He also developed a technique for observing the resonant scattering of gamma rays by nuclei using high-speed rotors.

Moon was elected to the Fellowship of the Royal Society in 1947. He gave the Royal Society's Rutherford Memorial Lecture on a visit to Australia in 1975 and was awarded its Hughes Medal in 1991. Moon died on 9 October 1994.

For further information on Moon see 'Philip Burton Moon' by W.E. Burcham and G.R. Isaak, *Biographical Memoirs of Fellows of the Royal Society* **42**, 1996, 249-264.

#### DESCRIPTION OF THE COLLECTION

The material is presented as shown in the List of Contents. It covers the period 1929-1996. Throughout the collection material has been labelled by Burcham with explanatory notes and many are reproduced in the catalogue entries.

Section A, Biographical, includes Moon's autobiographical accounts for his Royal Society Personal Record, and material assembled by W.E. Burcham relating to his and G.R. Isaak's Biographical Memoir of Moon. There is documentation of Moon's career and honours including his election to the Fellowship of the Royal Society and the award of its Hughes Medal in 1991.

Section B, University of Birmingham, includes a little material relating to the Department of Physics and Moon's Deanship of the Faculty of Science and Engineering. The bulk of the papers relate to the development of nuclear physics at Birmingham and include material relating to the 40th anniversary of the proton synchrotron, celebrated in 1993, and the 'Birmingham Proton Synchrotron Archive' assembled by W.E. Burcham.

Section C, Research, covers Moon's work in a number of areas from the late 1920s to the 1990s. There is documentation of his work on positive ions and neutrons during the 1930s and wartime work on atomic power. This includes research material of M.L.E. Oliphant. There is material relating to Moon's post-war work on rotors and molecular beams and to his research with the University of Birmingham synchrotron.

Section D, UK Accelerator Development, consists of correspondence and papers covering two themes: Moon's contribution to discussions in 1955 regarding the proposed development of a high energy accelerator at the Atomic Energy Research Establishment, Harwell, and Moon's service on the Working Party of the Physics Committee of the National Institute for Research in Nuclear Science during 1960.



Section E, Drafts, publications, lectures and broadcasts, comprises a chronological sequence of drafts 1940-1992, including unpublished wartime work on radio signals. There is a nearly complete set of Moon's off-prints. Lectures and broadcasts material includes manuscript drafts for broadcasts in the 1940s and lectures to the Poynting Physical Society. There is also documentation of his 1975 Rutherford Memorial Lecture and a lecture on J.H. Poynting given during the centenary celebrations of the Department of Physics in 1980.

Section F, Correspondence, is slight and includes only one extended exchange, with M.L.E. Oliphant, 1937-1946. Other correspondence of note is that with D.R. Herschbach, Nobel laureate for Chemistry 1986, and with W.E. Burcham.

There is also an index of correspondents.

#### LOCATIONS OF OTHER MATERIAL

In a note written after completion of the Royal Society Biographical Memoir of Moon (see A.13), Professor W.E. Burcham noted that:

Further biographical material was held by Mrs Lorna Moon (widow) and Mr Anthony E. Moon (son).

Papers relating to Moon were also to be found in School of Physics files deposited with the University Archives.

Timothy E. Powell  
Peter Harper  
Bath 1997

**SECTION A**

**BIOGRAPHICAL**

**A.1-A.50**

A.1-A.22

AUTOBIOGRAPHICAL AND BIOGRAPHICAL

A.23-A.45

CAREER, HONOURS AND AWARDS

A.46-A.50

MISCELLANEOUS



## Biographical

### A.1-A.22      AUTOBIOGRAPHICAL AND BIOGRAPHICAL      ca 1940-1996

- A.1      Obituaries:  
  
          *The Times*, 24 October 1994.  
  
          *Daily Telegraph*, 28 October 1994.  
  
          *Independent*, October 1994.
- A.2      Typescript curriculum vitae, first prepared 1942, updated with manuscript additions to 1975.
- A.3-A.9      Royal Society Personal Record.  
  
          Moon prepared a number of versions of his Royal Society personal record, intended for different audiences. Two versions survive of Moon's manuscript entries for the Royal Society 'Green Book', the official format for autobiographical information provided by Fellows. There are also manuscript and typescript drafts of three further versions intended to supplement the entries in the Green Books.
- A.3      Green Book entry found in envelope inscribed '[...] first attempt - too long and apologetic [...] 1987/88'.
- A.4      Green Book entry inscribed 'This account dates from 1987/88 [...] Further additions/corrections January 1992 in ballpoint'.
- A.5      Manuscript draft of autobiographical account, 10pp.
- A.6-A.8      Typescript autobiographical accounts.
- A.6      Version 1, 17pp.
- A.7      Version 2. Two 17pp drafts, the later dated '03.08.92'.
- A.8      Version 3. Two 16pp drafts, dated '2 Nov. 1992' and '14.1.93'.

### Biographical

- A.9 Two sets of 'Additional information', 7 and 12 August 1992, paginated 16-18 and 17-18; manuscript notes.
- A.10 Information on Moon's career provided by University of Birmingham Department of Physics, 3 June 1987.
- A.11-A.19 'Philip Burton Moon', by W.E. Burcham and G.R. Isaak, *Biographical Memoirs of Fellows of the Royal Society*, **42**, 1996, 249-264.
- A.11 Copy of Memoir.
- A.12 26pp typescript of longer version of the memoir.  
  
This was printed out for this collection from 3.5-inch disk provided by W.E. Burcham (not retained).
- A.13 Burcham's typescript note on locations of biographical material about Moon used in the preparation of the Memoir, 2 October 1996 and photocopied manuscript notes on 'Contents of [Moon's] archives.'
- A.14-A.19 Correspondence, 1994-1996.  
  
In preparing the memoir Burcham and Isaak requested reminiscences of Moon from his friends and colleagues. On completion of the memoir Burcham deposited this material with the Moon archive.  
  
Arranged in alphabetical order.
- A.14 Allibone, T.E.  
  
Bethe, H.A.  
  
Colley, D.C.  
  
Daniels, H.A.  
  
Davies, J.



**Biographical**

- |      |  |
|------|--|
| A.15 | French, A.P.<br>Halley, B.J.<br>Hardie, W.G.<br>Hibbard, L.U.  |
| A.16 | Ilakovic, K.<br>Jeffreys, B.<br>Knight, R.H.<br>Munday, G.L.   |
| A.17 | O'Connor, D.A.<br>Oliphant, M.L.E.<br>Pease, R.S.<br>Peierls, R.E.<br>Sharp, J.G.  |
| A.18 | Shoenberg, D.<br>Simons, J.P.<br>Stoddard, K.M.<br>Symonds, J.L.   |
| A.19 | Tabor, D.<br>Thorne, L.W.<br>Young, K.M.   |
| A.20 | 'Moonshine' by H.R. Shaylor, talk with reminiscences of Moon to University of Birmingham Senior Common Room, 7pp typescript, 1996. |

### Biographical

A.21 Moon's 1p typescript note on his first scientific paper (*Bibliog.* 1, 1929).

A.22 Typescript list of publications 1929-1940.

Manuscript lists of 'Original publications' 1929-1979, and 'Reviews etc' 1937-1983.

A.23-A.45

### CAREER, HONOURS AND AWARDS

1931-1994

A.23 Appointment as Assistant Lecturer, Imperial College, London, 1931.

Correspondence from G.P. Thomson, May-June 1931.

Appointment as Lecturer, Imperial College, London, 1934.

References, June 1934. Referees are G.P. Thomson, J.A. Ratcliffe, M.L.E. Oliphant and J. Chadwick.

A.24 Appointment as Lecturer, University of Birmingham, 1938.

Correspondence with Oliphant, January 1937, January - June 1938.

For further correspondence with Oliphant *re* Moon's move to Birmingham see F.18.

A.25 Correspondence *re* possible joint work with G.P. Thomson at Imperial College London, May, June 1939.

Thomson asked Moon to collaborate on work towards 'the possibility of producing a source of atomic energy' and Moon spent the summer working with Thomson.

See also F.19.

A.26 Correspondence *re* Moon's service with Ministry of Supply, March - July, 1942.

Moon was seconded to the Ministry of Supply and sent to join the British Scientific Central Office in Washington D.C., USA in 1942. He was released from his service for an early return to the UK in July.



### Biographical

- A.27                      Correspondence *re* membership of the Radio Board, September 1942.
- G.P. Thomson was deputy chairman and asked that Moon be appointed to the Board.
- A.28                      Correspondence *re* offer of post with reconstituted British Scientific Central Office in Washington D.C., USA, October - November 1942.
- Moon declined the offer.
- A.29                      University of Birmingham notice of increase to war bonus, 10 December 1943.
- Appointment as Reader in Atomic Physics, University of Birmingham, 1943.
- Letter, 5 July 1943.
- A.30                      Appointment as Assistant Professor, University of Birmingham, 1946.
- Letter, 8 February 1946; notice of pay increase, 18 February 1946.
- Appointment as Professor of Physics, University of Birmingham, 1946.
- Letter, 8 March 1946; notice of pay increase, 16 December 1946.
- A.31, A.32              Election to Fellowship of the Royal Society, 1947.
- A.31                      Correspondence *re* candidature, April-June 1943.
- A.32                      Notice of election etc, 1947.
- A.33                      Letters *re* examinerships at University of Edinburgh, 1948 and 1950.
- Correspondence, January - February 1950, *re* possible offer of Chair of Physics, University of Toronto.
- Letter *re* Moon's application for study leave, 27 June 1972.



### Biographical

- A.34-A.37      Retirement, 1974.
- Moon retired from the Poynting Chair of Physics in 1974.
- A.34      Letter *re* possible continuation of research after retirement, 12 December 1973; exchange *re* information about Moon for the *University of Birmingham Bulletin*, March 1974, including copy of Moon's curriculum vitae; Department of Physics 'Weekly Bulletin', 30 September 1974, with notice *re* retirement; etc.
- A.35-A.37      Conference on Scientific Aspects of High Speed Rotation, University of Birmingham, 19-20 September 1974.
- This conference was held in honour of Moon to mark his retirement.
- A.35      Programme; list of visitors to the conference; menu for conference dinner; correspondence, September 1974 and January 1975.
- A.36      *Scientific Aspects of High Speed Rotation*, Department of Physics, University of Birmingham, 1975. Published conference proceedings.
- A.37      'Resonant scattering of gamma rays using high speed rotation'. Bound volume of off-prints presented to Moon during the conference.
- A.38      Royal Society Rutherford Memorial Lecture, 1975.
- Moon delivered his lecture 'Yarns and spinners: recollections of Rutherford and applications of swift rotation' at Monash University during a visit to Australia, 10 April 1975. See also E.41, E.42.
- Letter of congratulation, 7 May 1975; itinerary for visit to Australia, 31 March - 15 May [1975].
- A.39      Invitation to become Honorary Life President, Poynting Physical Society, University of Birmingham, 6 February 1975.
- Note of thanks for service on Royal Society Government Grant Board B, 21 November 1975.



## Biographical

- |           |   |                  |
|-----------|---|------------------|
| A.40      | Moon's 80th birthday, 1987.<br><br>Article in <i>University of Birmingham Bulletin</i> , 15 June 1987.  |                  |
| A.41      | Letter <i>re</i> Moon Lecture, University of Birmingham, 5 June 1991.<br><br>This was delivered by Karl Knop.   |                  |
| A.42-A.44 | Royal Society Hughes Medal, 1991.<br><br>Moon was awarded this Medal 'In recognition of his contributions in three main areas of science nuclear physics, the discovery of gamma-ray resonances, and the use of colliding molecular beams to study chemical reactions'. |                  |
| A.42      | Correspondence <i>re</i> award, June-December 1991.   |                  |
| A.43      | Citation and publicity <i>re</i> the award from <i>Royal Society News</i> and other publications.   |                  |
| A.44      | Photocopy of award certificate and drawing of medal and other material for commemorative table-mats.  |                  |
| A.45      | Death, 9 October 1994.<br><br>Letter of condolence from students of Moon in Pakistan, 3 November 1994; programme for memorial concert, 20 December 1994.  |                  |
| A.46-A.50 | <b>MISCELLANEOUS</b>  | <b>1928-1991</b> |
| A.46      | Miscellaneous personal correspondence, 1971-1991.   |                  |
| A.47      | Correspondence and papers <i>re</i> walking stick design, 1983.<br><br>Moon designed a walking stick that would stand up by itself.<br><br>Includes diagrams of the design.   |                  |

### Biographical

- A.48                      Press-cuttings about Moon and his work:
- 'Back-room boy will advise Mr Atlee - At Atom talks, ca 1946.
- ' "Lead into Gold" on Birmingham's atom-splitter', *Evening Despatch*,  
                              ?1940s.
- 'The builder of "Moon's Empire" ', *Birmingham Post*, 22 November 1961.
- A.49                      Photographs:
- Group photograph inscribed on verso by Moon 'Alchemists, probably 1928  
                              [...] Don't know why I was not there'.
- Group photograph inscribed on verso by Moon 'Sidney Alchemists, probably  
                              1929'. Includes Moon.
- Photograph inscribed on verso 'ITV panel on nuclear power, about 1955'.  
                              Includes Moon.
- Group photograph of participants at meeting of Birmingham and Soviet  
                              physicists, ?in Birmingham, ?1950s. Includes Moon.
- A.50                      Letter to *University of Birmingham Bulletin*, 6 November 1989; sheet of  
                              Department of Physics headed notepaper with Moon as Poynting Professor.



**SECTION B**

**UNIVERSITY OF BIRMINGHAM**

**B.1-B.54**

B.1-B.3                      GENERAL CORRESPONDENCE AND PAPERS

B.4-B.11                    DEPARTMENT OF PHYSICS

B.4-B.6                    Teaching

B.7, B.8                   Buildings

B.9-B.10A                History of the Department

B.11                        Miscellaneous

B.12-B.16                   FACULTY OF SCIENCE AND ENGINEERING

B.17-B.54                   NUCLEAR PHYSICS AT BIRMINGHAM

B.17-B.23                General correspondence and  
papers

B.24-B.54                'Birmingham Proton Synchrotron  
Archive'

**University of Birmingham**

**B.1-B.3                      GENERAL CORRESPONDENCE AND PAPERS                      1949-1950**

- B.1                      Menu for Dinner in Honour of the Vice-Chancellor, 2 March 1949.
- B.2                      Memorabilia from University Jubilee celebrations, May 1950.
- B.3                      Request for summary information on M.L.E. Oliphant for the Public Orator, on the occasion of Oliphant receiving Honorary Degree from the University, 1950, and Moon's notes on Oliphant.

**B.4-B.11                      DEPARTMENT OF PHYSICS**

- B.4-B.6                      Teaching
- B.7, B.8                      Buildings
- B.9-B.10A                      History of the Department
- B.11                      Miscellaneous

**B.4-B.6                      Teaching                      n.d., 1966-1973**

- B.4                      'Physics, Course II. Revision Notes (Dynamics)', 11pp typescript, n.d..
- B.5                      Syllabus for 'Course I. 1966-67 Introductory Atomic Physics'; example sheets for 'Physics Course 1 September, 1968'.
- B.6                      Reports on teaching and research activities, 1969-1973.



University of Birmingham

B.7, B.8	Buildings	1960s
B.7	Plans for 'Physics "East" buildings' extension, 1960s.	
B.8	Programme for luncheon on the opening of the new Physics East building, 6 July 1967; plan and brief correspondence <i>re</i> naming and sign-posting of physics buildings, 1969; 2p typescript note on modernisation of the Poynting Lecture Theatre, 1969.	
B.9-B.10A	History of the Department	1973-1994
B.9	Exchange between R. H. C. Davis, Department of History and Moon <i>re</i> historical photographs, 1973; letter <i>re</i> Department archives etc, 1988; historical account of Department in the 1920s by K.E. Grew, 5pp typescript, 1994.	
B.10, B.10A	Centenary of the Department of Physics, 1880-1980.	
	Moon and Professor T.L. Ibbs co-authored a booklet to mark the centenary, <i>1880-1980 Physics at Birmingham</i> (Department of Physics, University of Birmingham, 1980). There were extensive corrections to this booklet and a new edition was published in 1995.	
	In connection with the centenary Moon also delivered a lecture on J.H. Poynting on 7 October 1980 (see E.43).	
B.10	Programme and handbook; reminiscences by Sir Arthur Vick, 21 September 1980; '100 Years of Physics at Birmingham', [University] <i>Gazette</i> ; menu for Reunion Dinner, 20 September 1980.	
B.10A	Three differently annotated and corrected copies of first edition of <i>1880-1980 Physics at Birmingham</i> .	
	A copy of the 1995 reprint is in the set of Moon's publications at E.30.	



University of Birmingham

**B.11**                      **Miscellaneous**                      **?1951-1969**

B.11                      Programmes for physics teachers' conferences at the Department of Physics, ?1951 and 1957; departmental notice, 1960; notice of and 4pp manuscript notes for Moon's talk to physics undergraduates, 15 January 1968; memorandum from Moon to W. E. Burcham *re* Staff Committee, 1 December 1969.

**B.12-B.16**                      **FACULTY OF SCIENCE AND ENGINEERING**                      **1969-1974**

Moon was Dean of the Faculty 1969-1972.

B.12                      Entry for the Vice-Chancellor's Annual Report, 1969.

Brief correspondence; manuscript and typescript draft.

'Open Day 1970', article by Moon for *Birmingham Post* introducing the Faculty of Science and Engineering.

B.13                      Entry for the Vice-Chancellor's Annual Report, 1971.

2pp typescript; notes.

Entry for the Vice-Chancellor's Annual Report, 1972.

2pp typescript.

B.14                      General Faculty correspondence, 1971-1972.

B.15                      Annotated programmes for Degree Day congregations, 1969, 1971, 1972; typescript formulae for presenting students to the Vice-Chancellor, 1972.

B.16                      Programme for Degree Day Congregation, 14 December 1974.

Moon gave the interval address.



University of Birmingham

**B.17-B.54                      NUCLEAR PHYSICS AT BIRMINGHAM                      1952-1996**

B.17-B.23                      General correspondence and papers

B.24-B.54                      'Birmingham Proton Synchrotron Archive'

**B.17-B.23                      General correspondence and papers                      1962-1994**

B.17-B.20                      Correspondence, 1962-1965, *re* nuclear physics at Birmingham with particular reference to nuclear accelerators and work carried out therewith.

In 1963 the Department of Scientific and Industrial Research (DSIR) was proposing to reduce the number of nuclear machines in UK universities. With the synchrotron at Birmingham approaching the end of its life the DSIR withdrew support from accelerator research, hoping that the Physics Department would then concentrate research in other areas of nuclear and solid-state physics. Instead the Department, believing that the University of Birmingham should retain its nuclear capability, diverted other resources to the support of the accelerators and argued that a new accelerator (cyclotron) be sited at the University of Birmingham.

See C.41-C.50 for material relating to Moon's research work carried out with the synchrotron, and section D for Moon's contributions to national policy on accelerators

B.17                      1962-1963.

Includes note on meeting between Sir Harrie Massey, C. Jolliffe (DSIR) and Moon, May 1963, to discuss future support of nuclear physics at Birmingham; letter from Moon to B.H. Flowers, 26 November 1963, lays out the case for the University retaining an accelerator

B.18                      1964 March-June.

Includes Moon's statements of the case for nuclear facilities at Birmingham, 2 April and 6 May.

B.19                      1964 September-November.



University of Birmingham

- B.20 1965, n.d.
- B.21-B.23 Fortieth Anniversary of the Birmingham Synchrotron, 1993.
- In summer 1953 the Synchrotron at Birmingham University became the first proton synchrotron to operate at its full design energy. A reunion was held on 16 September 1993 to celebrate the anniversary of this event.
- See also B.51, B.52.
- B.21 Papers re the synchrotron sent to Moon by ?D.F. Bracher, 28 May 1993.
- B.22 'The Birmingham Proton Synchrotron (initiated by Professor Oliphant)' by D.F. Bracher, 5pp typescript.
- B.23 'University of Birmingham Physics & Space Research 1993 Newsletter', with piece about the 40th anniversary; letter re anniversary booklet, 6 August 1994.
- B.24-B.54 'Birmingham Proton Synchrotron Archive' 1952-1996
- This material was assembled by J.D. Lawson and W.E. Burcham in 1996. It was listed by Burcham in two parts - BS/1-BS/4 being papers assembled by Lawson and BS/5-BS/29, those assembled by Burcham himself.
- The catalogue entries reproduce the numbers assigned to the material in the original listings by Burcham, which are themselves retained at B.24 and B.31.
- Item BS/4 is described in the list at B.24 as being 'Temporarily retained by Mrs B. van der Raay in School of Physics WEB Nov 96'.
- B.24-B.30 Lawson material.
- The introduction to the material by Burcham states:  
'During the years 1995 and 1996 Dr J.D. Lawson FRS worked on the preparation of his historical article Early British Synchrotrons, expected to be published by the Atomic Energy Authority early in 1997. It includes a section on the Birmingham synchrotron for which Lawson consulted several former members of the staff of the Department of Physics. The papers that he collected in this way were returned to Birmingham in October 1996 via Dr P. M. Rolph and are contained in the envelope marked BS(L) [Not



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retained]. Some of them will be referred to in the article itself under a Birmingham label, and copies of some have been placed in the CERN archives'.

- B.24                      2pp manuscript introduction to and listing of the material.
- B.25                      BS/1. Covering letter from Lawson to P.M. Rolph, 22 October 1996.
- B.26                      BS/2. Envelope of 'Photographs of synchrotron photographs in possession of Dr J.L. Symonds, with notes on each'.
- B.27-B.30                BS/3. Correspondence 'from members of the Australian team to Lawson', 1995-1996.
- B.27                      BS/3/1. J.L. Symonds.
- B.28                      BS/3/2. L.U. Hibbard.
- B.29                      BS/3/3. D.S. Robertson.
- B.30                      BS/3/4. D.E. Caro.
- BS/3/5. C.A. Ramm.
- B.30A                    BS/4. Photographs and copy of 1954 article by Moon for *Times Science Review*.
- The material is listed (B.24) as being 'Temporarily retained by Mrs B. van der Raay in School of Physics WEB Nov 96'.
- B.31-B.54                Burcham material.
- The introduction to the material by Burcham states:  
'W.E. Burcham, as Oliver Lodge Professor in the Department of Physics, helped in 1952/3 to bring the synchrotron to completion. In 1960, under delegation from the Head of Department (P.B. Moon) he took general charge of both the technical development and experimental programme of

University of Birmingham

the machine. [...] The box file, marked BS(B) [not retained] contains a selection of papers relating to the machine and its programmes; there are in no way a complete record. Notes on the individual papers follow, with a numbering meant to join to the Lawson papers'.

- B.31                      3pp manuscript introduction to and listing of the material.
- B.32                      BS/5. 'Articles and data sheets'.
- B.33                      BS/6. Wiring diagram for the synchrotron, 1952.
- B.34                      BS/7. Manuscript notes on 'Programme & machine under GW Hutchinson', 1960.
- B.35                      BS/8. Manuscript notes on 'Synchrotron Performance', etc., 1960.
- BS/9. Synchrotron personnel circulation list; list of technical staff duties.
- B.36                      BS/10. Manuscript notes on 'Possible deuteron experiment' and 'Injection of other ions', 1961.
- B.37                      BS/11. Manuscript notes by C.P. van Zyl on experiments at the Harwell cyclotron, 1961; offprint on peripheral collisions, 1961.
- B.38                      BS/12. 'Maintenance of Proton Synchrotron and Hydrogen Liquifier', 2pp typescript, 1961; 'Synchrotron finances Aug 1962 - July/Dec 1963', 3pp duplicated typescript, February 1963.
- BS/13. Manuscript notes on general programme by H.B. van der Raay, 1961-1962.
- B.39                      BS/14. Manuscript 'Summary of number of theses on synchrotron work', 1961-1962.
- BS/15. Manuscript notes on 'Topics for H.E. physics reports, 1961-1962.



University of Birmingham

- B.40                      BS/16. Plans for beam transport; 'Proposals for a second beam line' by van der Raay, 6pp typescript, 1962.
- B.41                      BS/17. Department of Physics Report on 'Beam transport equipment for the Birmingham proton synchrotron' by W.E. Burcham, 1962.
- B.42                      BS/18. Photograph of injection equipment, 1963.
- BS/19. 'Synchrotron running schedule 1963'; manuscript notes on 'Design group work'.
- B.43                      BS/20. 'Experimental programme for the Birmingham synchrotron 1962-1967' by Burcham, 6pp typescript, September 1962; 'Future experiments with the Birmingham synchrotron' by J.D. Dowell, 5p duplicated typescript, 1964; manuscript notes.
- B.44                      BS/21. Photocopied manuscript notes on 'Synchrotron Operation 1965-6-7'.
- B.45                      BS/22. Letter from Moon to the Vice-Chancellor *re* grant for the maintenance of the synchrotron, 19 February 1965.
- BS/23. Photocopied manuscript notes on synchrotron performance
- B.46                      BS/24. Annotated paper for meeting of Nimrod Group, 3 March 1967.
- B.47                      BS/25. Papers relating to closure of Birmingham synchrotron, 1967 and its dismantling 1968.
- B.48, B.49                BS/26. Papers relating to establishment of the Birmingham Film Analysis Unit, 1965-1969.
- B.48                      1965-1966.
- Includes Department of Physics Report on 'Proposal for an automatic film analysis unit at Birmingham', February 1966.

University of Birmingham

- B.49                      1967-1969.
- B.50                      BS/27. Manuscript list of papers relating to the high energy physics programme 'thrown away 1980'.
- B.51, B.52                BS/28. Papers relating to 40th Anniversary of the synchrotron, September 1993.  
  
See also B.21-B.23.
- B.51                      Correspondence *re* arrangements.
- B.52                      Lists of possible participants and those attending; programme.
- B.53, B.54                BS/29. Papers *re* J.D. Lawson's section on the Birmingham synchrotron in his article on early British synchrotrons, 1995-1996.
- B.53                      Typescript drafts: 'Very rough draft', paginated 19-23, with manuscript annotations; 'Second draft', paginated 19-24; 'Final draft', paginated 19-31 + figures.
- B.54                      Miscellaneous papers and correspondence *re* Lawson's draft and background material.



**SECTION C**

**RESEARCH**

**C.1-C.50**

C.1-C.4

POSITIVE IONS

C.5-C.7

NEUTRONS

C.8-C.13

ATOMIC ENERGY

C.14-C.40

ROTORS

C.41-C.50

SYNCHROTRON

Research

C.1-C.4                      POSITIVE IONS                      ?1928-1992

C.1                      Index cards used by Moon for bibliographical references and notes on the literature.

A label by W.E. Burcham, Moon's Royal Society Memorialist, states:  
'?1928-32 Probably collected by PBM while a graduate student, & at I.C. pre-neutron mainly solid state - discharges electron diffraction etc'.

C.2-C.4                      'Positive ions', material so labelled.

C.2                      'The thermal ionization of sodium by tungsten', 7pp manuscript draft dated July 1934, with letters to Moon from H. Ferreira 19 April and 13 November 1938.

A note by Burcham states:  
'Unpublished work 1938 with Ferreira at Imp Coll on thermal ions of Na on W. See personal record, version 1 [A.6] not rounded off because of fission!'

C.3                      Letter from J.H. Fremlin, 5 February 1987, enclosing photocopy of 1938 report and 1947 offprint, *re* use of stretched rubber sheet for 'estimating two-dimensional field distributions', and 1943 offprint *re* hard valves.

Moon and Oliphant had first suggested the use of the stretched rubber sheet in a paper of 1929 (*Bibliog.* 1).

C.4                      Letter from Lady Jeffreys, 6 April 1992, enclosing offprints on potential barriers, 1942 and 1955, with manuscript note by Moon beginning 'The original Bullard/Moon machine, finished at ECB's parents' home in Norwich during the Easter vacation 1931'.

C.5-C.7                      NEUTRONS                      1932-1939, n.d.

C.5                      'Neutrons', contents of Moon's folder so inscribed: 1p typescript 'Extract from Sir George Thomson's personal memoir' recording work with Moon and others on neutrons 1932-1938, photocopies of papers and offprints by Moon *et al* on neutrons (*Bibliog.* 6, 8-10, 18).



## Research

- C.6 Hardback notebook labelled on front cover 'Imp. Coll. Neutrons (Time of Flight)'.

Used from the front for data from Maxwell and boron runs *ca* July-December 1938, paginated 1-49, and from the back for notes on runs July 1938-July 1939.

Loose material intercalated.

- C.7 Untitled manuscript rough draft + graphs beginning 'The following discussion tends to show that an evacuated tube nearly 3000 feet long and 1 foot diameter, made of material reasonably absorbent to neutrons would be a suitable collimator for velocity spectroscopy', n.d.

<b>C.8-C.13</b>	<b>ATOMIC ENERGY</b>	<b>1939-1981</b>
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- C.8-C.13 'Correspondence 1939 and 1945 from Oliphant and Moon [...] and MLO's memoranda about isotope repn, plans for nuclear accelerators [...]'. Contents of Moon's folder so inscribed divided into seven for ease of reference.

Much of the material found in the folder was created by Moon's predecessor as Poynting Professor of Physics, M.L. E. Oliphant.

The extensively annotated folder, with labels attached by Burcham, has been retained at C.8

- C.8 Original folder.

Letter from J.A. Robertson, UK Atomic Energy Authority, covering return of material to University of Birmingham Physics Department and suggesting possible course of action *re* further of Moon's papers relating to atomic energy held by UKAEA, 23 November 1981.

Letter of recommendation from Oliphant to Aliens Tribunal, vouching for R.E. Peierls, 9 October 1939.

- C.9 Correspondence and papers 1940-1941, chiefly *re* M.A.U.D. Sub-Committee and, later, M.A.U.D. Committees; undated draft letters from Moon to F. Brundrett and others, chiefly *re* contribution of H.A.H. Boot.



### Research

- C.10 'Choice of Fissile Material', 2pp typescript with table of 'Qualitative summary of some properties of fissile elements of importance for power production and for nuclear explosives' (two copies, one corrected), ?by Oliphant.
- C.11 Typescript drafts by Oliphant: 'Nuclear Energy and the Future', 3pp, 18 August 1945; 'Science and the Future', 3pp, 12 October 1945; 'Atomic Energy', 8pp, 19 October 1945; 'Power production by Nuclear Methods', 3pp, n.d.
- Copy of 'Statement (by Los Alamos Scientists)' on the implications of the atomic bomb, 5pp typescript.
- C.12 Manuscript draft of letter to W.A. Akers by Oliphant headed 'Nuclear Physics and T.A.', with attached 9pp typescript and manuscript draft 'The Acceleration of Particles to Very High Energies', ca 1945.
- Letters from R.E. Peierls to Oliphant, 26 July and 16 November 1945, with copies of Peierls's letters to W.N. Haworth and G.N. Watson, *re* developments at the University of Birmingham, July-December 1945.
- Peierls's letter of 16 November responds to remarks of Oliphant's on atomic power and scientists' responsibilities, as reported in the press.
- C.13 'The Genesis of the Nuffield Cyclotron and the Proton Synchrotron. A Memoir by Sir Marcus Oliphant. 1967', with manuscript note by Moon on front cover.
- For material *re* Moon's research with the synchrotron see C.41-C.50 below; for material *re* nuclear accelerators at the University of Birmingham see B.17-B.54.



Research

<b>C.14-C.40</b>	<b>ROTORS</b>	<b>1945-1992</b>
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C.14-C.26	Contents of folder divided into thirteen for ease of reference.
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Folder labelled by Burcham:

'Rotor development from the beginning: Bull, Marshall, Ralls. Review light articles on rotors & molecular beams'.

T.H. Bull, D.G. Marshall and M.P. Ralls were colleagues in the Birmingham Physics Department working on rotors.

C.14	Photocopy of 1916 article <i>re</i> molecular collision. Inscribed by Burcham 'Attracted Philip's attention at school (see personal record)'.
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C.15	Typescript memoranda by Moon:
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'Possible experiments with high speed molecules', 1p + figure, 7 February 1945.

'Possible experiments with fast molecular beams', 6pp, 1 February 1946 + 1p 'Note added 7/2/46'.

C.16	Correspondence with suppliers of equipment, 1946-1951, 1956.
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C.17	'Notes on proposed experiments with Alkali Metal Atomic Beams' by D.G. Marshall, 5pp typescript, 9 April 1952.
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C.18	'A mechanical method for the activation of fast reactions' by Moon and T.H. Bull, manuscript draft with extensive addition and correction, <i>Bibliog.</i> 27, 1954.
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C.19	Correspondence <i>re</i> remarks at Faraday Society Discussion following paper by Moon and Bull on study of fast reactions, April-May 1954.
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C.20	'Further experiments using High-Speed Rotors', manuscript draft with manuscript inscription by Moon 'TH Bull (undated, probably after our 1954 paper)'.
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### Research

- C.21-C.24                    'Rotors and Molecular Beams'.
- C.21                        Part I, by Moon, 21pp typescript, 27 August 1969.
- C.22                        Part II, by Moon, 35pp typescript + figures, April 1970.
- C.23, C.24                Part III, by C.T. Rettner and J.P. Simons, 27pp + 17pp appendices + figures, ca 1976. 2 folders.
- C.25                        Correspondence and papers 1973-1975. Includes material *re* speed record set by high-speed rotors at University of Birmingham.
- See also B.22.
- C.26                        Correspondence from M.R. Ralls, 1987, and T.H. Bull, 1987, 1989, *re* rotors and molecular beams; last page of undated earlier letter from Bull to Moon; manuscript notes and figures etc.
- C.27                        Hardback notebook labelled on front cover '1949'.
- Used for notes and calculations on rotors.
- Material intercalated includes photograph of rotor.
- C.28                        'Note on the development of resonant scatterings' by Moon, 3pp typescript, 29 October 1959, with a later note by Moon attached.
- Photocopy of extract from published proceedings of Royal Society Discussion Meeting on 'The measurement of electron-neutrino angular corrections', 5 December 1957, including Moon's contribution, with later annotation by Moon. Found with 'Note' above.



### Research

- C.29-C.31 'Simons & others, especially D.R. Bates, J.N. Dodd, G.R. Isaak (on reaction) I. Powis, I.W.M. Smith'. Contents of folder so inscribed divided into three for ease of reference.
- Folder also labelled by Burcham ' "CHEMICAL" rotors'.
- Chiefly correspondence *re* rotors, the 1992 correspondence is *re* Moon and G.R. Isaak's note on 'The Resonant Atom/Atom/Photon Interactions'.
- C.29 Correspondence with J.P. Simons, 1980, 1986-1992, and from R. Tuckett, 1986, and I.W.M. Smith, 1989.
- C.30 Correspondence with D.R. Bates, C. Bederson and J.N. Dodd, 1992; letter to I. Powis, 1993.
- C.31 3 slightly different 2pp typescript drafts of 'The Resonant Atom/Atom/Photon Interactions'; 1p manuscript notes on 'Papers relevant to rotor chemistry'.
- C.32 Manuscript notes, calculations, and graphs *re* five tests with rotor equipment. Undated, possibly 1940s.
- C.33-C.40 'Mol. beam chemistry/Historical' and Rotors'. Contents of Moon's folder so inscribed divided into eight for ease of reference.
- The folder was also labelled by Burcham 'Double rotor expt Preparation of last papers 1989-94'. Most of the material is drafts for 'Pulse compression and intensity enhancement in rotor-propelled molecular beams', *Bibliog.* 56 (1991). See also E.24-E.28.
- C.33 'Pulse compression and intensity enhancement [...]', 13pp typescript + 3pp appendix and figures annotated 'Early version 30.8.89'.
- C.34 8pp typescript of section of 'Pulse compression and intensity enhancement [...]' beginning '8. Broad-blade and fan designs'; 4pp typescript drafts of 'Appendix: design of cavity rotors', and 'Appendix 2 A high-intensity disc system'; 2pp typescript draft of '§3 Kinetics of evaporation'.
- C.35 Sets of figures.



### Research

- C.36                      Typescript pages from unidentified draft; figure and graph; 1p typescript notes on 'D.G. Marshall, Ph.D. thesis, Birmingham, May 1950'.
- C.37                      Manuscript calculations labelled by Burcham 'Calculations in retirement? For last papers?'; manuscript note of 'Further possibilities'.
- C.38                      Photocopy of article on 'Low-energy pulsed beam sources', with Moon's manuscript notes found therewith.
- C.39, C.40              Photographs.
- C.39                      Moon holding rotor, 1976; equipment, 1973
- C.40                      Equipment, 1975.

**C.41-C.50              SYNCHROTRON    1951-1956, 1963**

Material relating to UK accelerator policy is presented in section D. Further material *re* the synchrotron at the University of Birmingham can be found at B.17-B.20 and C.13 above.

- C.41                      Hardback notebook labelled on ?front cover 'Synchrotron 1951-52' and on ?back cover '7/51 to 3/52'.
- Used from the front and from the back for notes, calculations etc.
- Loose material intercalated.

- C.42                      Hardback notebook labelled on front cover 'Synch (mostly) [?] PBM'.
- Used from the front and from the back for notes and calculations, some on rotors. 1952.
- Loose material intercalated, some dated 1953-1954.



### Research

- C.43                      Hardback notebook labelled on front cover 'P. B. Moon High-energy physics Lectures from various staff members' and '10/52 to 11/53'.
- Used from the front and at the back for notes on lectures.
- Loose material intercalated.
- C.44-C.47                'Synchrotron'. Contents of Moon's folder so inscribed divided into four for ease of reference.
- C.44                      Note *re* injector for the synchrotron, November 1950; 'Report on the Conference on High Energy Accelerators for Nuclear Research', duplicated typescript, 7 June 1952.
- C.45                      Two drafts of 'Spare charge and ionisation phenomena in fixed-gradient proton synchrotron' by Moon, 7pp and 8pp typescript, *Bibliog.* 33 (1956); 1p typescript abstract.
- C.46                      'The space-charge limit in a synchrotron', annotated 'Appendix 1', 3pp typescript, November 1953, with telegram and letter, 1952, found therewith; letter to Sir John Cockcroft, September 1955, *re* space charge effects.
- C.47                      Manuscript notes etc.
- C.48                      'Proposal for injecting protons into a synchrotron by dissociation of molecular ions' by Moon, typescript and manuscript draft with manuscript corrections + figures, *Bibliog.* 31 (1956).
- C.49                      Manuscript draft pages found with preceding.
- C.50                      'Possible methods of reducing the spread of energy in a beam of charged particles' by Moon and D.A. O'Connor, 5pp duplicated typescript + figure, 17 May 1963; response by J.H. Fremlin, 2pp typescript, 28 May 1963.



SECTION D	UK ACCELERATOR DEVELOPMENT	D.1-D.18
D.1-D.8	Correspondence and papers <i>re</i> proposed new UK High Energy Accelerator, 1955.	
D.1	Bound copy of 'Symposium on High Energy Accelerators (A.E.R.E., Harwell, 13/14th May, 1955) Summary of Proceedings' by T.G. Pickavance.	
D.2	Copy of Atomic Energy Research Establishment, Harwell report 'Development of High Energy Accelerators in the U.S.A.' by Pickavance and W. Walkinshaw, 1955.	
D.3-D.6	Correspondence and papers <i>re</i> proposed high energy accelerators at Harwell, 1955.	
D.3	1955, July. Copies of replies to circular letter from the UK Atomic Energy Authority to leading physicists 'asking which type of machine should be built to meet the future needs of high energy particles for nuclear research'.	
D.4	1955, September	
D.5	'Notes on the High Energy Acclelerator Programme', 3pp duplicated typescript; manuscript notes.	
D.6-D.8	Background information. 3 folders.	
D.9-D.18	National Institute for Research in Nuclear Science (NIRNS), 1960.  Moon served on the NIRNS Physics Committee and its Working Party on Future Accelerator Policy.	
D.9	Minutes of Physics Committee, 8 January 1960. Records Moon joining the Working Party.	
D.10	Papers <i>re</i> Helium Bubble Chamber, March 1960.	



### **UK Accelerator Development**

- D.11-D.16                Papers for meeting of the Working Party on Future Accelerator Policy, 27-28 March 1960. 6 folders.
- D.17                      Papers for meeting of Joint Consultative Panel for Nuclear Research and NIRS Physics Committee, 9 May 1960.
- D.18                      Background information on CERN Proton Synchrotron; manuscript notes; list of particle accelerators in worldwide.

**SECTION E                      DRAFTS, PUBLICATIONS, LECTURES AND BROADCASTS                      E.1-E.43**

**E.1-E.30                      DRAFTS AND PUBLICATIONS**

**E.1-E.29                      Drafts**

**E.30                      Off-prints**

**E.31-E.43                      LECTURES AND BROADCASTS**



**Drafts, publications, lectures and broadcasts**

**E.1-E.30                      DRAFTS AND PUBLICATIONS                      1929-1995**

E.1-E.29                      Drafts

E.30                              Off-prints

**E.1-E.29                      Drafts    1940-1992**

A chronological sequence of material relating to publications or to the possible intention to publish. The material includes drafts found labelled 'Unpublished miscellaneous' mostly relating to wartime work on shortwave radar and later publications material.

Where applicable reference has been made to the Bibliography in the Royal Society memoir of Moon (A.11) in the form *Bibliog.* ...

E.1-E.18                      'Unpublished miscellaneous', material so labelled divided into eighteen for ease of reference.

E.1                              'Report on the use of a low-power quenched oscillator as combined receiver and transmitter', 4pp duplicated typescript, 3 December 1940.

E.2                              'Notes on the detection of signals in the presence of random noise', 7pp typescript + figure, with manuscript additions, 19 December 1940.

'Notes on detection of signals in presence of noise', 4pp typescript, n.d. but probably related to preceding.

E.3                              'The detection of signals initially below noise-level', 3pp duplicated typescript, 1 January 1941, with manuscript 'Notes on meeting at Haslemere 15/1/41' on verso of page 3.

E.4                              'Addendum to Lisbon notes on signal/noise ratio and band width', 2pp typescript, 14 February 1942.

'Conditions for optimum signal-to-noise ration in velocity-modulated mixers', 6pp typescript and manuscript, nd but probably related to preceding.



**Drafts, publications, lectures and broadcasts**

- E.5 'Experiments related to the detection of moving targets by Doppler effect (July-August 1943), 4pp typescript with manuscript additions and corrections, 11 September 1943.
- E.6 'Plans for measuring the active-time curve of the test gadget (II)', 2pp typescript and manuscript, December 1944.
- E.7 'Notes and suggestions relating to A.A. prediction', 10pp typescript + figure with manuscript correction, n.d.
- 'A method of range measurement', 2pp duplicated typescript; manuscript notes, n.d. Found with preceding.
- E.8 Untitled 2pp typescript + figures on prediction of aircraft flight, possibly related to preceding work on targeting anti-aircraft fire, n.d.
- E.9 'Mössbauer line shifts and quadrupole splittings in some ferrocyanides and ferricyanides', with H.A. Begum, 5pp typescript + tables and figures. Not listed in *Bibliog.*, latest bibliographical reference 1967.
- E.10-E.14 'Professor Moon. Radiography with transparent scintillators'. Contents of Moon's folder so inscribed, divided into four for ease of reference (with original folder at E.10).  
Label on verso by Moon states:  
'Not published - senior medical physicist said that radioisotopes would not tolerate cross-hairs and was being overtaken by computerised [?]'.
- E.10 Original folder.
- E.11 'Radiography with transparent scintillators', with L.A. Hooper, typescript and manuscript draft with manuscript corrections.
- E.12 Tables, figures and summary.
- E.13 Earlier draft, 14pp typescript + tables.



**Drafts, publications, lectures and broadcasts**

- E.14 'Final Report. May 1968. (A summary of thesis submitted for the degree of Ph.D. in April 1968.) Lesley A. Hooper', 2pp typescript.
- E.15, E.16 'Possible review article for Rep. Prog. Phys. 1975-78'. Contents of Moon's folder so inscribed divided into two for ease of reference.
- Moon offered to write an article on 'Attainment and laboratory uses of high speed rotation'.
- E.15 Correspondence with Institute of Physics *re* proposed article, 1975-1978.
- E.16 'Magnetically suspended high-speed rotors' by A.E. Huston, 6pp duplicated typescript + figures.
- E.17 Manuscript draft with label by Burcham 'Sunrise & Sunset Maybe about 1980?'.
- E.18 'Principle of a beta-ray spectroscope combining high resolution with large angular aperture', 4pp typescript + figures, n.d.
- E.19 'A suggested  $\beta$ -ray spectroscope', 2pp typescript, 3 October 1947.
- E.20 'Notes on the possibility of observing the "complete"  $\gamma$ -ray spectrum of nuclei following neutron capture', 4pp typescript + figure, 4 October 1947.
- E.21 'Vibrations of fibres in centrifugal stress', 7pp typescript with manuscript corrections + figure, *Bibliog.* 47 (1972).
- E.22 'University of Birmingham Superlative', *Bibliog.* 53 (1983).
- This was a letter to the editor clarifying an article in the *University of Birmingham Bulletin*, 7 November 1983, on the speed record set in 1975 by the University of Birmingham high-speed rotor. The folder includes a copy of the article.
- See also C.25.

**Drafts, publications, lectures and broadcasts**

- E.23                    'Proposal for an atomic furnace', 4pp typescript + figures, 1989.
- E.24-E.28            'Pulse compression and intensity enhancement in rotor-propelled molecular beams', *Bibliog.* 56 (1991).  
  
See also C.33-C.35.
- E.24                    13pp typescript, 23 September 1989.
- E.25                    6pp typescript, 19 January 1991.
- E.26                    10pp typescript, 14 May 1991.
- E.27                    Sets of figures.
- E.28                    Correspondence from *Contemporary Physics*, 1990-1991, and with W.E. Burcham, 1991, *re* drafts and publication.
- E.29                    'Reminiscences and discoveries (the London Physics Club, 1928-1953)', *Bibliog.* 57 (1992).  
  
4pp typescript; two corrected and annotated off-prints
- E.30                    **Off-prints** **1929-1995**
- E.30                    A nearly complete sequence of Moon's off-prints. Some are annotated or corrected by him. Not all are listed in the Bibliography.



**Drafts, publications, lectures and broadcasts**

<b>E.31-E.43</b>	<b>LECTURES AND BROADCASTS</b>	<b>1946-1983</b>
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E.31-E.40      'Talks & writings', material so labelled. Drafts for lectures, talks and radio broadcasts.

E.31              Draft on atomic power annotated 'BBC talk 1946'.  
4pp typescript; page of typescript draft found attached.

E.32              Draft on atomic power annotated 'Final draft - sent 30/4/47'.  
3pp typescript.  
  
Draft on atomic power annotated 'BBC - 1st draft', nd.  
6pp typescript

E.33              Manuscript draft on molecular and nuclear structure for lecture to 'PPS [Poynting Physical Society] 29/1/52'.

E.34              Manuscript notes for lecture for lecture to 'PPS [Poynting Physical Society] 28/1/54'.

'Benjamin Franklin', manuscript draft for lecture '23.2.54'.

E.35              'Resonators for Radiations', manuscript notes for lecture to 'PPS [Poynting Physical Society] 17/1/55'.

'Tops and gyroscopes', manuscript notes for lecture to 'Hull 21/10/57' and PPS [Poynting Physical Society] 22/10/57'.

E.36              'High Speed rotation', manuscript notes and draft for lecture to 'PPS [Poynting Physical Society] 19/11/68'.

**Drafts, publications, lectures and broadcasts**

- E.37                      Address at Prize-giving, King Edward VI Grammar School, Stourbridge, 7 November 1974.  
  
                             Programme; 3pp typescript.
- E.38                      Manuscript notes for lecture on molecular collisions annotated 'To whom? When? Probably 1977 or 78'.
- E.39                      University of Birmingham Congregation Address, December 1983.  
  
                             3pp typescript draft with manuscript corrections.
- E.40                      Manuscript notes for lecture to 'Lunar Society', n.d.  
  
                             'Chemical & Nuclear Reactions', manuscript draft of lecture, n.d.
- E.41, E.42                'Yarns and spinners: recollections of Rutherford and applications of swift rotation', Royal Society Rutherford Memorial Lecture, Monash University, Australia, 10 April 1975.  
  
                             See also A.38.
- E.41                      Pages of manuscript and typescript drafts.
- E.42                      List of dates; illustration for lecture; letter from Royal Society *re* draft for publication, 27 September 1977; 'Marked proof'.
- E.43                      'John Henry Poynting', Department of Physics, University of Birmingham, 7 October 1980.  
  
                             This was held as part of the Centenary celebrations of the Department of Physics. See B.10.  
  
                             Manuscript draft and background material found therewith.



SECTION F	CORRESPONDENCE	F.1-F.26
F.1	<b>E.G. Acheson Ltd/British Acheson Electrodes Ltd</b>  Supply of pure graphite for minature ovens.	1943
	<b>Bodkin, T.</b>	1958
F.2	<b>Bradley, D. A.</b>  Photon scattering.	1987
F.3	<b>Burcham, W. E.</b>  Burcham was Oliver Lodge Professor of Physics at the University of Birmingham 1951-1980. He and G.R. Isaak wrote Moon's Royal Society Biographical Memoir.  Letters to Burcham. The letters include Moon's observations on his health, and reminiscences.	1988-1994
F.4	<b>Chadwick, J.</b>	1950
	<b>Cockcroft, J. D.</b>	1943
F.5	<b>Colley, D. C.</b>  Colley was Professor of Elementary Particle Physics at the Univesity of Birmingham.  Includes Moon's reminiscences.	1985-1989
F.6	<b>Crocker, V. S.</b>  Crocker worked at the Atomic Energy Research Establishment, Harwell, Berkshire.  Isotope separation and molecular beams.	1975, n.d.

### Correspondence

F.7	<b>Daniels, H. A.</b>	1986
	Calculations <i>re</i> voting statistics.	
	<b>Davies, J.</b>	n.d.
	Davies was a mathematics lecturer at Wolverhampton Polytechnic and a friend of Moon's.	
F.8	<b>Dunlop Rubber Co. Ltd</b>	1943
	Rubber sheet and other rubber equipment.	
F.9	<b>Fertel, G. E. F.</b>	1942
	Request to transfer to the University of Birmingham.	
	<b>Frisch, O. R.</b>	1943
F.10	<b>Greenlees, G. W.</b>	1959
	Greenlees was a member of the Department of Physics at the University of Birmingham.	
	Letter to Greenlees from J. Schiffer <i>re</i> the Mössbauer Effect.	
	<b>Gunston, B.</b>	1983
	Carbon-fibre rod used in rotors.	
F.11, F.12	<b>Herschbach, D. R.</b>	1979-1994
	Herschbach was a joint recipient of the Nobel Prize for Chemistry in 1986.	
F.11	Correspondence 1979-1994.	
F.12	Printed background material.	



### Correspondence

F.13	<b>Hopkins, H. G.</b>	1942
	Hopkins worked at the National Physical Laboratory, Teddington, Middlesex. Work on valves.	
	<b>Huq, S. S.</b>	1974
F.14	<b>Institute of Physics</b>	1944
	Letter thanking Moon for talk to Electronics Group, Birmingham, February 1944.	
	<b>Isaak, G. R.</b>	1992
	Isaak was a Professor of Physics at the University of Birmingham. He and W.E. Burcham wrote Moon's Royal Society Biographical Memoir. Chiefly <i>re</i> health.	
	<b>Karlik, B.</b>	n.d.
F.15	<b>Lawson, J. D.</b>	1957
	Moon's 'suggestion of injection by dissociation of $H_2^+$ '.	
	<b>Leibnitz, H. Maier-</b>	1974
F.16	<b>Malmfors, K. G.</b>	1952-1953
	Work on resonant scattering of gamma-rays. Includes typescript draft sent to Moon for comment.	
F.17	<b>Mott, N. F.</b>	1947
	<b>Muller &amp; Co. (England) Ltd</b>	1942

### Correspondence

- |           |   |           |
|-----------|---|-----------|
| F.18-F.22 | <b>Oliphant, M. L. E.</b>   | 1937-1946 |
|           | <p>Moon worked with Oliphant in the Cavendish Laboratory 1928-1931. In 1937 Oliphant was appointed Poynting Professor of Physics at the University of Birmingham. Moon joined him in Birmingham as Lecturer a year later. In 1950 Oliphant returned to Australia to take up the Directorship of the Research School of Physical Sciences, Australian National University, Canberra. Moon succeeded him as Poynting Professor.</p> |           |
| F.18      | 1937-1938. Correspondence <i>re</i> possible move of Moon to University of Birmingham. See also A.24.   |           |
| F.19      | 1939. Includes correspondence <i>re</i> Moon's work with Thomson at Imperial College London. See also A.25.   |           |
| F.20      | 1941-1944. Includes correspondence <i>re</i> work in progress at Birmingham while Oliphant was in Australia, 1943, and while Moon was serving with the British Supply Council in the USA, 1944.   |           |
| F.21      | 1945. Chiefly correspondence <i>re</i> current research and post-war plans.   |           |
| F.22      | 1946. Developments at Birmingham.   |           |
| F.23      | <b>Parkhouse, G.</b>  | 1992      |
|           | <b>Polkingthorne, J. C.</b>   | 1992      |
|           | <p>Letter to Polkingthorne, with enclosures, <i>re</i> 'public misunderstanding of science'.</p>  |           |
|           | <b>Proctor, B.</b>  | n.d.      |
|           | <p>Proctor was a student of Moon's at the University of Birmingham in the 1950s.</p>  |           |



**Correspondence**

F.24	<b>Ramsey, H. T.</b>	1943
	<b>Simons, J. P.</b>	1986
	<b>Stever, H. G.</b>	1943
	<b>Sutton, R. W.</b>	1943
F.25	<b>Tabor, D.</b>	1992
	Tabor was a student of Moon's at Imperial College London in the 1930s.	
	<b>Thomson, J.</b>	1943
	<b>Turgel, R.S.</b>	1987
	Turgel was a student of Moon's at the University of Birmingham in the 1940s	
	Includes photocopies of photograph of Turgel and J.E.R. Holmes in a Birmingham physics laboratory.	
F.26	<b>Vick, F. A.</b>	1991
	<b>Wilkinson, D. H.</b>	1991
	Exchange re Nabla-V Club at Cambridge and London Physics Club.	
	<b>Young, K.M.</b>	1985, 1995

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