

THE ROYAL COMMISSION ON HISTORICAL MANUSCRIPTS

Report on the correspondence and papers of

CECIL REGINALD BURCH

(1901-1983)

physicist and engineer

deposited in

Bristol University Library

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CONTEMPORARY SCIENTIFIC ARCHIVES CENTRE

under the guidance of the Royal Society's

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

Catalogue of the papers and correspondence of

CECIL REGINALD BURCH CBE FRS

(1901 - 1983)

including material relating to

GEORGE JAMES BURCH FRS

(1852 - 1914) and

FRANCIS PARRY BURCH

(1899 - 1933)

Compiled by:

Jeannine Alton

Peter Harper

Margaret Erskine

Deposited in the Wills Memorial Library, University of Bristol

1986

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GENERAL INTRODUCTION

PROVENANCE

The material was received at various dates via the Physics Department, University of Bristol, from T.E. Allibone FRS who had assembled it while preparing his Memoir for the Royal Society.

DESCRIPTION OF THE COLLECTION

The material is presented in the order shown in the list of contents. Although it includes documentation of all aspects of Burch's career and scientific activity, the coverage is uneven and sometimes regrettably scanty.

This is in part attributable to Burch's temperament and preferred way of working. His early life (academic upbringing, public school and Cambridge) might suggest a conventional establishment figure, yet he was in fact a 'loner', working idiosyncratic hours and holding research posts or personal appointments largely independent of departmental structures and bureaucracies. In addition, his career was subject to abrupt changes of direction, often for personal reasons of which the best documented was his decision to leave the Metropolitan-Vickers Company after the distressing death of his brother Francis in 1933. The changes were rarely permanent however, and Burch often returned to a research topic (e.g. optics) after a break. He was himself aware of psychological complications in his life, sometimes attempting to describe them more or less obscurely (see, e.g. A.25, B.122 - B.125) but generally preferring to look forward with new ideas for continuing research, as he did to the very end of his life (see, e.g. A.3A). The drawbacks of such a personality and career pattern are the lack of administrative discipline in dating or paginating notes and drafts, and Burch's failure to maintain correspondence files in favour of using the backs of letters - even those in current use - for notes. There are thus serious gaps in all sections of the documentation, and problems in assigning more than tentative dates or descriptions to much of the technical material.

Section A (Biographical) reflects Burch's modest and unassuming personality in that the record of his own career is outweighed by records of his family. In particular, there is biographical and scientific material relating to his father George James Burch

and his work on optics, as well as various documents relating to his brother Francis. His older brother Raymond, who was responsible for the name 'Bill' which quickly replaced Burch's forenames and who was killed in the Royal Flying Corps in France in 1918, is represented by brief correspondence (A.63). His mother Constance Emily was also a remarkable character, not least for her friendship with C.L. Dodgson (A.54). As well as this family pietas, Burch's awareness of his own contributions to science, and his prolific '"Capital" of Research Ideas' can be found at A.3, A.3A.

Section B (Research) is the most substantial and covers many of Burch's areas of research in varying degrees of detail, the fullest being those on mineral dressing and on medical matters. The material on optics as originally received was disappointing for this important area of Burch's work, but was much strengthened by the arrival of additional papers when the catalogue was already in draft: the 'new' material now appears as an Addendum (B.186-B.200). The surviving material for the period at the Metropolitan-Vickers Company is almost wholly concerned with the work of his brother Francis which Burch was especially anxious to have adequately remembered. Explanatory notes are provided to accompany the separate topics in this Section.

Section C (Lectures), though extending widely in time (1932-81), is nevertheless somewhat scanty. Burch's university appointments did not entail regular teaching and lecturing. Thus the surviving lectures were conference talks or invitation lectures such as the Parsons Memorial Lecture in 1959, the Royal Society Review Lecture 'University physics - the challenge of technology' in 1965, and the 'Optics 78' Conference at Bath. Although some of the lectures (such as those mentioned above) were subsequently published, it would seem that Burch adopted an informal, even colloquial, lecturing style; this, combined with his haphazard filing methods, may mean that by no means all his talks are documented.

Section D (Publications) is similarly uneven. Very little survives from the MetroVick period and only one article, ' "Squeeze" Significance tests', with I.T. Parsons, is fully documented with correspondence, drafts, calculations and diagrams. There are however several undated writings (D.32 - D.44) possibly intended for publication.

Section E (Correspondence) has probably suffered most from Burch's working methods. There is one relatively substantial sequence of letters on aspects of mineral dressing and mining (E.19 - E.24), but much of the remaining material consists of Burch's

manuscript drafts, carbons or photocopies of his outgoing letters. Replies, if they were received, may have been used for research notes and calculations and thus lost to view.

A full account of Burch's career and research can be found in the memoir by T.E. Allibone written for the Royal Society and published in 1984 (Biographical Memoirs of Fellows of the Royal Society, 30, 3-42), a copy of which is enclosed at A.1. References to this work are given in the catalogue in the form (Memoir, p. ...). Published works listed in the accompanying Bibliography are given in the form (Bibliog. ...). For ease of reference, a photocopy of the Bibliography is included, with permission, on pp.62-65.

LOCATIONS OF FURTHER MATERIAL

The prototype Ultra-Violet Reflecting Microscope, made by Burch c.1946 for use with short wavelength ultra-violet radiation and used by R. Barer in the Department of Human Anatomy, Oxford, is in the Museum of the History of Science, Oxford.

The grinding and polishing machinery used in the manufacture of the aspherical mirror for the microscope is in the Science Museum, London.

The tape-recording of Burch's lecture 'MetroVick Memories' is held at the Royal Society, London.

Additional biographical material relating to George James Burch, including letters of condolence to Mrs. Burch, is in the Museum of the History of Science, Oxford.

ACKNOWLEDGEMENTS

Our main debt is to T.E. Allibone FRS for retrieving the material, for help and information, particularly on the history of the screen-grid valve, and for permission to include a copy of the Bibliography of Burch's writings.

We are also grateful to Dr. G.L'E. Turner and Mr. A.V. Simcock of the Museum of the History of Science, Oxford, for information.

JBA

PH

MJE

Oxford 1986.

SUMMARY OF THE CAREER OF C.R. BURCH

b.1901	Oxford
educ. 1907-14	Dragon School, Oxford
1914-19	Oundle School
1919-22	Gonville and Caius College, Cambridge
1922-33	Research Department, Metropolitan-Vickers Company
1933	Death of Francis Parry Burch
1933-35	Leverhulme Fellow in Optics, Imperial College, London
1936	Research Associate (Fellow from 1944), H.H. Wills Physics Laboratory, Bristol University
1937	Marriage to Enid Grace Morice (d.1981)
1943	Award of Duddell Medal of the Physical Society
1944	Election to Fellowship of the Royal Society
1948-66	Royal Society Warren Research Fellow in Physics, Bristol University
1954	Award of Rumford Medal, Royal Society
1958	Conferral of C.B.E.

SECTION A BIOGRAPHICAL A.1 - A.74

A.1 OBITUARIES AND TRIBUTES

A.2 -A.5A AUTOBIOGRAPHICAL

A.6-A.22 CAREER, HONOURS AND AWARDS

A.23-A.29 MISCELLANEOUS BIOGRAPHICAL ITEMS

A.30-A.71 PERSONAL AND FAMILY

Personal correspondence A.30

George James Burch A.31-A.52

Constance Emily Burch A.53-A.55

Francis Parry Burch A.56-A.64

Irene Constance Burch A.65, A.66

Enid Grace Burch A.67-A.70

Cecil Hicks A.71

A.72-A.74 PHOTOGRAPHS

A.1 OBITUARIES AND TRIBUTES

Obituary from The Times, 5 August 1983.

Memoir by T.E. Allibone (Biographical Memoirs of the Royal Society, 30, 1984).

Biographical

A.2- AUTOBIOGRAPHICAL
A.5A

A.2 Autobiographical article for McGraw-Hill, 1965.

Letter from editor, ms. and typescript drafts, proofs and copy of published article; also later letter from Burch to McGraw-Hill (1978) declining to write on his own work but enclosing a list of published papers 'in order of recall'.

Proof of Burch's entry for 1967 edition of Debrett with covering letter.

Carbon of Burch's letter to Senior Executive Secretary, Bristol University, 1975, suggesting he should be described as 'Hon. Physicist-in-ordinary'.
Relates to his 'Who's Who in America' entry.

Invitation (declined by Burch) to write the history of his years at Metropolitan-Vickers, 1976.

A.3 Correspondence with G.E.H. Foxon re early work on 'phase-contrast' micrography, 1976.

Correspondence with A.Q. Morton, Royal Scottish Museum, re development of Apiezon oils and greases at Metropolitan-Vickers, 1978.

Letter to Vice-Chancellor, Southampton University, 1978, concerning his honorary post at Bristol after his retirement.

Letter to F.G. Smith, 1981, re testing and refiguring telescope mirrors at Imperial College, London.

Summary of Burch's influence over his colleagues and successors, shown in diagramatic form, 1p. n.d.

Single page of autobiographical account by Burch, n.d.

A.3A A sequence of documents illustrating Burch's interest in developing new research ideas after his official retirement in 1966.

'The "Capital" of Research Ideas of C.R. Burch, 1966'.

4pp. typescript, probably a summary of Burch's intended areas of research after his retirement, listing and describing 17 topics of active interest.

Continued

Biographical

- A.3A 'Note on Non-Contact Testing of Lens Surfaces', 1973.
(Cont'd.) 6pp. typescript with 1p. ms. diagram on project to develop a test 'for radius of curvature as well as for sphericity'.

'Interferometry of Large Autostigmatic Systems', 1973.

6pp. typescript (with photocopy), outlining a student project.

'Preheat Torches', 1974.

8pp. typescript outlining a possible Ph.D. project to design a gas torch using various types of gas.

Includes 1p. typescript of 'Separation of Methane from Marsh gas', also described as a possible student project.

Letter to Vice-Chancellor, Bristol, 1975, on the threat to Ph.D. work by the SRC Working Party report on postgraduate training, with specific examples of successful research projects at Bristol.

Another copy is at E.29.

'A Preferred Variant of Bates' Inverting Interferometer', n.d.

1p. typescript, outlining a student project.

'Dust Core Filter Bridges', n.d.

2p. typescript, outlining a student project.

- A.4 'Autobiographical Notes' written by Burch for the Royal Society, 1981.

Ms. and typescript drafts, with related correspondence, June 1980-July 1982, and envelope annotated by T.E. Allibone.

These notes are chiefly concerned with the development of the aspheric reflecting microscope and include details of involvement of A.M. Tyndall in the joint production and research project, funded by the Nuffield Foundation. Burch dwells upon his reaction to Tyndall's forgery of his signature on the application and the stress, physical and mental, he suffered as a result (Memoir, p.28). The notes conclude with his family and education, with particular reference to his brother Francis's work and early death.

For correspondence with the Nuffield Foundation, 1949-51, see B.192-B.197.

Biographical

A.5, 'Metrovick Memories'
A.5A

Burch was due to give a lecture on this topic at Warwick University, October 1983, but died in July. There are however a number of incomplete drafts and a tape-recording was made in May 1983 (Memoir, p.38).

A.5 Correspondence with organiser (F.A. Vick) and former colleague (G. McKerrow), 1982.

Typescript draft paginated 1-13 (lacks p.12) and 10pp. transcript of 'tape of Warwick Lecture recorded May 1983'.

Background material including lists of Burch's published papers.

A.5A Various incomplete ms. drafts, variously paginated or unpaginated.

Miscellaneous ms. sheets of calculations found with drafts.

A.6- CAREER, HONOURS AND AWARDS
A.22

A.6 Birth certificate (date of registration 8 October 1901) and four educational certificates, 1916-19.

A.7 Correspondence re Dragon School and early days in Oxford, 1974-81.

Letter of 7 October 1981 recalls Burch's debt to the headmaster of the Dragon School ('The Skipper') (Memoir, pp.5-6).

Letters and telegram from Oundle School re scholarship and exhibitions, 1918, 1919.

1p. photocopy re science teaching and facilities at Oundle School, 1978.

Biographical

- A.8 Letter and telegram from Caius College re scholarship, 1917, 1918.
- Letter from Ewelme Exhibition Endowment, Oxford, re award of exhibition, 1919.
- Testimonials, Cambridge, 1922 (includes two from R.A. Peters).
- A.9 B.A. certificate, University of Cambridge, 1922.
- A.10 Certificate of exemption from matriculation examination, University of London, 1934, with covering letter.
- A.11 Fellowship of the Royal Astronomical Society, 1935 (letter of election).
- A.12 Fellowship, Institute of Physics (certificate), 1935.
- A.13 Certificate of Premium awarded to Burch and C. Sykes by The Institution of Electrical Engineers, 1935, for joint paper 'Continuously Evacuated Valves and their Associated Equipment' (Bibliog. 42).
- A.14, A.15 Ph.D. University of London, 1936.
- A.14 Completed application form, with recommendation by G.P. Thomson, 1932 and abstract of thesis, 1936 (photocopies).
- Letter notifying Burch of the award, 1936.
- A.15 Certificate, 1936.
- A.16 Award of Duddell Medal, Physical Society (certificate), 1943.
- See also C.2.
- A.17 Fellowship of the Royal Society, 1944.
- Notification of election.

Biographical

- A.18, A.19 The Royal Society's Rumford Medal, 1954.
- A.18 Letter notifying Burch of the award and 10 letters of congratulation.
- A.19 Certificate in presentation folder.
- A.20 Document conferring C.B.E., January 1958. In original envelope.
Includes one letter of congratulation.
- A.21 Certificate of membership, Institution of Mining and Metallurgy, 1961.
- A.22 Honorary D.Sc., Bristol University, 1966.
Letter of congratulation; presentation address.

Letter inviting Burch to accept membership of Convocation, Bristol University,
1966.

Certificate of Charter Membership, International Association for Mathematical
Geology, 1968.

Letter from British Vacuum Council, 1981, requesting Burch to allow his name
to be given to their annual prize, including conditions of entry.
See C.16 for Burch's speech on presenting the prize in 1981.
- A.23- A.29 MISCELLANEOUS BIOGRAPHICAL ITEMS
- A.23 Miscellaneous material re personal finances.
- A.24 Miscellaneous poems, pieces of prose and humour collected by Burch.
Includes Kipling and some German texts.

Biographical

- A.25 'Radical Psychectomy' - a Fantasy.
Various drafts for a script of 'an imaginary colour-film talkie', with a note
'This Fantasy is affectionately dedicated to all my Stoke friends. Bill'. n.d.
- A.26 Card for 80th birthday, 1981, signed by staff of 'the Fort', Bristol University,
with a photocopy of the signatures.
- A.27 'Taxonomy of Supervisors - Emblazonings'
Ms. descriptions and hand-drawn illustrations of coats of arms with humorous
intent.
- A.28 Two unidentified sketches.
Bristol University Christmas card, with photograph of scientific equipment.
- A.29 Visit to Egypt, 1981.
Typescript pages 7-17 of diary, 1-11 February. No indication of author and
probably not by Burch.

Biographical

A.30- PERSONAL AND FAMILY
A.71

A.30 PERSONAL CORRESPONDENCE

One folder only, in chronological order, 1931-82. Not indexed.

Note: Two of these letters may have been addressed to F.P. Burch.

A.31- FAMILY
A.71

A.31- George James Burch (father) (1852-1914)
A.52

Biographical material

A.31 Scrapbook, c.1886-c.1911.

Miscellaneous contents include:

The Oxford University Scientific Club: term cards, 1886-1910, notices of conversazioni 1887, 1905.

Reading Literary and Scientific Society: notice of AGM 1897, pages from a printed report of lectures delivered before the Society including 'The Language of Birds' (1893) and 'The Colour Sense' (1897) by G.J. Burch.

Newspaper cutting, 1899, re paper on 'Spectroscopic Examination of Contrast Phenomena' given by G.J. Burch to the British Association at Dover.

Lecture timetables for Oxford University Extension Summer Meetings, 1895.

'Reports of University Institutions', 1902, 1903, with reference to G.J. Burch's lectures and teaching.

Page from Oxford University Gazette, 1903, with notice of award of D.Sc. to G.J. Burch.

Continued

Biographical

- A.31
(Cont'd.) Various newspaper cuttings, 1903-1904, including article on inaugural lecture by G.J. Burch for course of 'evening classes for the people' at University College, Reading, and a report on the prize day of the Oxford Preparatory School, at which Raymond Burch received a prize.

Oxford University Extension Summer Meeting, 1905, newspaper cuttings of photographs and biographies of 'some notable figures', including G.J. Burch, and lecture timetables.

Newspaper cuttings re the Oxford Art Society's annual exhibition, with a reference to I.C. Burch, n.d.

Cutting from Oxford Chronicle, 1908, re 'Foreign Women Students' Vacation Course', with reference to Mrs. Burch's teaching.

Loose enclosures include:

Ms. copy of letter to First Lord of the Treasury from various fellow scientists including J.J. Thomson and J.S. Haldane, requesting a Civil List pension for G.J. Burch and giving details of his financial and familial circumstances, c.1911.

Newspaper cutting, 1924, re lecture given by D.V. Burch (daughter) on 'The World Below the Water' for the Sunderland Naturalists' Association.

- A.32 Letters from G.J. Burch to his wife, Constance Emily Burch, only one dated (30 March 1892).

Includes ms. of a poem 'The Mower and the Maid' dated 11 May 1883 in another hand.

- A.33 Newspaper cuttings of biographical interest, including notice of Civil List pension, and lists of G.J. Burch's publications, probably from Proceedings of the Royal Society.

Photocopy of obituary of G.J. Burch in Nature, 1914.

Copy of The Oxford Magazine, 1914, containing obituary of G.J. Burch.

Biographical

Notes and drafts

These manuscript notes, nearly all of which are secured into bundles by tape, are mostly undated and all are unpaginated. The subject-matter is usually optics, with one bundle of notes on the reaction of metals with concentrated acids.

It is probable that these notes were for lectures, some perhaps for the Oxford University Extension Classes, as the topics covered are not specialist.

- A.34 'Invention of the Telescope'.
- A.35 Untitled notes on the theory of the telescope.
- A.36 'Galileo's Telescope'.
- A.37 'Notabilia for "Light"'.
A.38 'Sources of Light'
- A.39 'To show the Re-composition of White Light from the spectrum'.
- A.40 'Testing' (of lenses, etc.).
- A.41 Untitled notes on an experiment with a microscope (1p. only).
- A.42 'The Colour Sense'.
Lecture delivered before the Reading Literary and Scientific Society,
27 April 1897.
- A.43 'On the Behaviour of Certain Metals with regard to Concentrated Acids'.
Abstract of lecture given by G. J. Burch and J.W. Dodgson.
Includes miscellaneous notes, some dated 1908.
- A.44 Notes described as 'on the Glass workers' cataract research', with forwarding letter from J.G. Malpas, University College, Reading, 12 January 1911.
See also A.48-A.50.

Biographical

- A.45 Notes detailing questions to be asked re glass workers' cataract.
See also A.48-A.50.
- A.46 'On a Perspective Microscope', 1887.
Reprint only from Proc. Roy. Soc., 42.
- A.47 'The Departmental Committee on Sight Tests', 1912.
Newspaper cuttings, received via several cutting agencies, on the subject of G. J. Burch's memorandum, published by this Committee, on colour-blindness.
- A.48-
A.50 The Royal Society Glass-workers' Cataract Committee, 1908-1914.
These papers chiefly consist of copies of reports, with some minutes and correspondence, made for the Committee. G. J. Burch's name appears on several of these reports, and he gave a paper entitled 'A Confusion Test for Colour Blindness' in March 1912.
3 folders.
A.50 includes notification of grant to Burch for research project on optics.
See also A.44, A.45.
- A.51 Galley-proofs of article on optics by Sir William Crookes, n.d.
- A.52 Reprints of four articles on human eye-sight, 1912, 1913.
- A.53-
A.55 Constance Emily Burch (mother) (1855-1937)
- A.53 Letters from the Burch children to their mother (includes one letter from Irene to her father), n.d.

Letter from Burch to his mother, 1925, re attempts to publish a joint paper with N.R. Davis with the help of C.G. Darwin (see Memoir, p.10 and Bibliog. 14).
Includes some personal news.

Biographical

- A.54 Photocopies of letters from C.L. Dodgson to Mrs. Burch, 20 May, 2 July, 13 December 1893, 3 May 1896, and correspondence 1971 re sale of these letters from N.R. Davies, C.R. Burch and D.V. Burch (Dorothy Violet, b.1889, testifying to Dodgson's freedom from impediment in his speech when in the company of children).
- The letters of 20 May and 2 July 1893, and of 3 May 1896 are reproduced in The Letters of Lewis Carroll, ed. M.N. Cohen and R.L. Green, 2 Vols. London 1979, but that of 13 December 1893 does not appear. See especially Vol.II, pp.955-6, where the editors describe Dodgson's relations with Mrs. Burch and her daughters Irene and Violet and express the view that they are 'one instance where his friendship with the mother surpassed that with the daughters'.
- A.55 'Rules' of Norham Hall, n.d.
- This establishment was a finishing school for foreign young ladies run by Mrs. Burch until August 1914 (see Memoir, p.5).
- A.56- Francis Parry Burch (brother) (1899-1933)
A.64
- A.56 Birth certificate, 1899.
- School Certificate, 1914.
- Testimonials from Winchester College and the Oxford Preparatory School, 1915.
- A.57 List of staff and boys of Winchester College, 1917 (Roll).
- A.58 Testimonial from Winchester College, n.d. ?1917 or later.
- Permit book for Military Area, Harwich (Memoir, p.7).
- Certificate of exemption from military service, 1918.
- List of successful candidates for the Goldsmiths' Company's exhibitions to Cambridge, 1920.
- Letter informing F.P. Burch of his Goldsmiths' Company's exhibition at Cambridge, 1920.
- Certificate, Cambridge O.T.C., 1920.

Biographical

- A.59 B.A. certificate, University of Cambridge, 1922.
- A.60 Testimonials from Caius and Clare Colleges, Cambridge, 1922.
- Letter of appointment from Metropolitan-Vickers Electrical Company Limited, and Employment Agreement, 1922.
- Testimonial from the Admiralty Research Laboratory, Teddington, 1922.
- Certificate confirming F.P. Burch's degree, 1932.
- A.61 'F.P. Burch, Caius'
- Undergraduate notebook: dynamical theory of gases, thermionics, etc.
- A.62 Page, probably from undergraduate notebook, 26 November 1920.
- A.63 2 letters from Raymond Burch, one enclosing a 'rather unique' aerial photograph of Winchester and one from France dated '2 May' shortly before he was killed in action.
- 2 letters from G. McKerrow (a colleague at Metropolitan-Vickers), 1929, 1930.
- A.64 'On Potential Dividers for Cathode Ray Oscillographs'.
- Photocopy of published paper communicated by J.J. Thomson, n.d.
- A.65, Irene Constance Burch (sister)
A.66
- A.65 '5 copies of the Christmas Card for 1910, designed by Irene C. Burch. To be kept. G.J. Burch' (in original envelope so inscribed).
- Irene was an active member of the Oxford Art Society.
- A.66 Two letters to Raymond Burch, n.d.

Biographical

A.67- Enid Grace Burch (née Morice) (wife)
A.70

A.67 Teacher's Diploma, University of London, 1924.

A.68 B.A. and M.A. certificates, (Girton College) University of Cambridge, 1929.

A.69 Miscellaneous financial items.

A.70 Health

Includes letter from C.R. Burch to his wife's doctor, detailing experimental treatment with oral B12 and asking for comment (probably never sent), 1975.

A.71 Document granting Cecil Hicks 'the exclusive right of Burial and Interment' in the South Metropolitan Cemetery, 1852.
(A distant relative on maternal side.)

A.72- PHOTOGRAPHS
A.74

A.72 Miscellaneous photographs of Burch, including 3 taken at Metropolitan-Vickers.

A.73 Miscellaneous photographs, probably Burch family and friends.

A.74 Framed photograph of unidentified member of Burch family.

SECTION B RESEARCH B.1 - B.200

LIST OF CONTENTS

B.1 -B.17A	METROPOLITAN-VICKERS COMPANY
B.18 -B.58 and B.186-B.200	OPTICS
B.59 -B.86	MINERAL DRESSING AND RELATED SUBJECTS
B.87	PYTHAGORAS PATTERNS
B.88 -B.92	WEIRS
B.93 -B.95	HOT-BLAST TORCH DEVELOPMENT
B.96 -B.110	STATISTICS
B.111-B.165	MEDICAL AND PSYCHOMEDICAL
B.166-B.185	MISCELLANEOUS

Research

B.1- METROPOLITAN-VICKERS COMPANY
B.17A

Burch was associated with Metropolitan-Vickers for 11 years, joining the research department in 1922 with his elder brother, Francis. It was the death of this brother, in extremely distressing circumstances in 1933, that precipitated Burch's departure from MetroVick and his return to academic research (at Imperial College under G.P. Thomson). Burch continued to be associated with the company for many years as a consultant.

Given the circumstances of Burch's departure from MetroVick it is unlikely to be an accident that almost all the surviving research material from this period relates to the work of his brother, Francis. In the autobiographical notes written for the Royal Society in 1982, Burch asked his future biographer to make reference to his brother's work at MetroVick (Memoir, pp.16-17).

- B.1 Research notebook of Francis Parry Burch labelled on flyleaf 'Drying No.2'.
In use c. June-July 1928. Some loose pages.
- B.2 Internal MetroVick correspondence for the attention of various persons
including F.P. and C.R. Burch, October 1930-March 1932.
These documents are F.P. Burch's copies and were presumably kept by his
brother for that reason.
- B.3- Work on valves by F.P. Burch, c.1931-33, kept together as a unit by
B.12 C.R. Burch.
- B.3 'An Account of the Erecting, Conditioning and Testing of Two Oscillator
Valves to be supplied to the G.P.O. for Oscillation in Push-Pull on
15 metres Wavelength'.
18pp. typescript signed by L.H.J. Phillips but with F.P. Burch's name
above the title.

'500 kW Demountable Valve Tests - Rugby. Summarised Log of Tests
from 19 August to 16 September 1931'.
6pp. typescript dated 5 May 1932.

Research

- B.4 Research Department Report on 'Continuously Evacuated Screen-Grid Valves', May 1932. By F.P. Burch.
Photocopy of 'Library File Copy'.

Folder also includes envelope annotated by T.E. Allibone, February 1984.
- B.5 Charts, graphs and blueprints. Some dated in 1931 and 1932.
- B.6- Ms. notes and narratives, n.d.
B.9 4 folders.
- B.10 Ms. drafts for papers, n.d. One on transmitting valves.
- B.11 'Hartmann test by Redman'
Ms. notes by C.R. Burch (1p. by F.P. Burch).
- B.12 Notes and narratives in German, mainly on historical topics and including account of Gallipoli by Compton Mackenzie.

No scientific content but found with preceding. May represent F.P. Burch's attempts to learn German at this time.
- B.13 Metropolitan-Vickers Research Department Report on Filaments for Small Demountable Valves, April 1932.
- B.14 Later historical account of screen-grid valve, its development and use (to 1943). n.d. or author but part of larger history written for the record after the war.

Included in the folder is a comment on the account and its possible date and authorship, taken from a letter sent to the compilers of the catalogue by T.E. Allibone, 19 October 1985.

Research

- B.15 Four Metropolitan-Vickers blueprints, 1933.
 'Degasser & Condenser for Pretreatment, Type P.3 Still', 'Arrgt of Oil Pump
 Unit for Type P.3 Still', 'Preheater for Type P.3 Still', and one unidentified.
- B.16 Metropolitan-Vickers blueprints (rotors), with covering letter, 9 July 1942.
- B.17 Photographs of distillation apparatus, valves, pumps, etc., 1927-33.
 Some with ms. identifications on verso by T.E. Allibone.
- B.17A Photographs of furnaces, etc., some with ms. identifications on verso.

 Photostat of paper on 'a new high temperature furnace on the surface com-
 bustion principle' (translated from the German).

 1p. from The Metropolitan-Vickers Gazette, April 1938.

 Letter from Metropolitan-Vickers re furnaces, 31 March 1943.

Research

B.18- OPTICS
B.58

After Burch's return to university life (first at Imperial College and then, from 1936, at Bristol) optics became his main field of research 'especially in the figuring of aspheric surfaces to extremely high degrees of accuracy, leading to the production of reflecting microscopes of wide aperture' (Memoir, p.4). Most of the following sequence of research material dates from the 1970s, that is, after Burch's official retirement in 1966.

For early work on optics at Metropolitan-Vickers and Imperial College see B.186, B.187, and for work at Bristol see B.188 et seq.

B.18 'Optical Notebook No.8'

Hard-cover notebook, inscribed inside front cover with name, address (Bristol) and title 'Reflecting Microscope'; presumably one of a sequence, of which no.2 is the only other one surviving (B.187).

The notebook is in poor condition, with covers and many pages loose; pages numbered 1-73; notes continue on rear cover and on 2 loose pages at rear.

The work consists of observations, calculations and narratives, in pencil and in red and black ink, none dated. The main work probably dates from Burch's earliest days at Bristol (Memoir, p.22) but Burch seems to have returned to the book in the 1970s, filling in the originally blank contents page with references to specific work on Schwarzschild equations and spheres, adding notes and queries in red ballpoint and interleaving a 1p. typescript note 'OSC of approximations to Schwarzschild curves. Present position - July 1974'.

The main content is a series of drafts and calculations on the design of microscopes with spherical and aspherical mirrors, ellipses, astigmatics, convex and concave mirrors, polishing techniques, 'see-saw' diagram, etc.

B.19 'Tortuous Templates for Pseudo-Planes. An Essay in Aspherising Technique'.
n.d. but c.1942 or later (see reference to 'See-saw diagram' (Bibliog. 59).

14pp. ms. draft of 'preliminary note', perhaps intended for submission to Mon. Not. R. astr. Soc.

Folder also includes 'A Study of Schmidt Camera Plates (Project No.440-2), Walter S. Adams for Theodore Dunham, Jr., Official Investigator, Progress Report, November 1, 1941'.

2pp. carbon copy with photograph, stamped 'Scientific Research and Experiment Department Admiralty'.

Research

- B.20 Large format notebook (lacks covers) with draft of 1945 paper 'Flat-fielded singlet aplanats' (Bibliog. 66), calculations.
- B.21 2 diagrams for 1963 paper (with M.R. Tubbs) 'Interference testing of reflecting objectives' (Bibliog. 91).
- B.22, B.23 Research on Reflecting Microscopes.
In 1972 Professor C. Andrew, then Professor of Applied Mechanics at Bristol, asked Burch to join him in applying to the Paul Instrument Fund for a grant to make 'the best possible reflecting microscope, N.A. = 0.95 (1.42 with oil), to prove its accuracy interferometrically and to demonstrate its performance'. The grant was not made. However, shortly afterwards Burch was approached by the Czechoslovak Embassy for a formal agreement of collaboration with M. Maly of the Czech Academy of Sciences to develop 'the best possible doubly aspheric Schwarzschild aplanat'. A student came from Czechoslovakia to learn about aspherising (Memoir, pp.36-37.)
- B.22 'Evolution of the Angle-Control Aspherising Machine', 1970.
Unpublished 21pp. typescript note listed by Royal Society memorialist as Bibliog. 97.
Burch's purpose in writing the note was to describe how he came to evolve his 'various angle-control aspherising machines, and to point out some further steps in the development which cry aloud to be done'.

'Personal Note on Reflecting Microscope Grant Application'.
Photocopy of the 5pp. typescript note attached by Burch to his and Professor Andrew's grant application, April 1972. In a section on health (p.2) Burch refers to a recovery in his mathematical ability sufficient to spot an error in a 1947 paper (Bibliog. 68). See also B.24.
This copy of the personal note was found attached to the copy of Bibliog. 97 above.
- B.23 Correspondence re Burch's formal collaboration with Czechoslovak scientists on their reflecting microscope development programme, 1972-75.
Includes copy of letter from Burch to B.H. Flowers, 28 June 1973, outlining proposed collaboration and enquiring about SRC policy in such a case.

Research

- B.24 'Zonal coma of semi-aplanat reflecting microscope' (with P.N. Murgatroyd), J.Phys., 1972 (Bibliog. 99).
This 'Letter to the Editor' arose when, 'in the process of planning a research in the manufacture of doubly-aspheric Schwarzschild-aplanat reflecting microscopes, C.R. Burch noted that his calculation (Burch 1947) of the offence against the sine condition of the simpler singly-aspheric semi-aplanat design, was invalidated by an algebraic mistake'. The letter 'corrects the algebra and gives computer-tabulated plots of the offence against the sine condition (OSC) for some semi-aplanats of infinite tube length'.
Draft of paper, figures and covering letter; reprint with ms. corrections.
- B.25 'Semi-Aplanat Reflecting Microscope with Elliptic Convex'.
2pp. ms. and typescript note, 2 January 1973, probably intended for J.Phys. as a follow-up to Bibliog. 99. (Not in Bibliog.)

Ms. notes and calculations possibly related to preceding. Some dated in 1974.

Reprint of Bibliog. 99, with ms. additions.
- B.26-
B.31 Ms. notes and drafts ('Schwarzschild's Curves', 'Schwarzschild Aplanats', etc.), graphs and calculations. Some papers are dated in 1974 and relate to work in collaboration with I.T. Parsons.
Five folders.
- B.32 'Wave Front Shearing Interferometer'.
Ms. and typescript drafts for unpublished paper, graphs, etc., c.1976.
- B.33 'Knife-Edge Testing Aspheric Astigmatic Systems'.
Notes, graphs, etc., 1976 or later. Perhaps related to Bibliog. 106.
- B.34 'Burch Flat Field 4 Mirror Anastigmatic Telescope, July 1978'.
4pp. typescript.

Research

- B.35,
B.36 Ms. and typescript notes and drafts, calculations, etc. on 'Double Purpose Telescope', '4 mirror Telescope', 'Bird watching', etc., c.1978. Possibly for lecture.
2 folders.
- B.37 'Inverting Interferometer'.
1p. typescript, diagrams, etc., c.1978.
- B.38 'Concentric Mirror Pair', c.1978.
4pp. ms. draft.
- B.39,
B.40 Papers relating to work on the Charterhouse-on-Mendip Observatory mirror, 1978.
- B.39 'First Report on 18" Telescope Mirror' in form of 3pp. draft letter to P. Armitage (Avon Education Authority); photocopy of report as sent 13 November 1978; letters of thanks, December 1978.

'An Astigmatic Telescope Mirror, and its Correction', n.d.
5pp. draft paper (with P. Armitage and J. Chard); second draft with amended title and additional author (N. Robson).
- B.40 Notes, drafts, figures, photographs re Charterhouse Observatory mirror, work on astigmatism.
- B.41-
B.43 Notes, drafts, figures, computer programs relating to 'Scatter-fringes of Doughnut', 'Scatter-Fringe Shape of a Paraboloid', etc.; also 'Note on Bates' tests on the 74" Pretoria Mirror', c.1979.
3 folders.
- B.44-
B.49 Ms. and typescript drafts, notes and narratives on various aspects of optics, with special reference to telescopes and reflectors. Many apparently intended for publication, but none listed in Bibliography. None dated, but probably late 1970s.
- B.44 'Obstruction-Free Cassegrain-Type Telescopes'.
Typescript drafts with ms. additions and corrections; clean copy.
- B.45 'On the Use of Astigmatism in Strip-Testing Telescope Mirrors'.
Photocopy of ms. drafts; typescript drafts.

Research

- B.46 'On the Use of Astigmatism in Testing Telescope Mirrors' (with D.F. Gibbs).
Ms. and typescript drafts, notes and figures.
- 'Strip-Test - S-curves'.
1 diagram.
- B.47 'Plate Diagram of a Tilted Mirror System'.
4pp. ms.
- 'Plate Diagram Theory'.
Ms. drafts.
- 'The Schmidt plates of Schmidt plates'.
3pp. draft.
- 'Skewed Schmidt Plate: Meridional Section'.
2pp. draft.
- B.48 'Note on Two-Beam Interferometer Design'.
3pp. draft.
- B.49 'Microscopy of Unstained Specimens'.
5pp. draft.
- B.50- Miscellaneous ms. notes, calculations, diagrams and graphs, none dated,
B.52 probably late 1970s, on various aspects of optics.
- B.50, Sequences of notes, etc. kept together by Burch.
B.51 2 folders.
- B.52 Loose pages.

Research

- B.53- Miscellaneous data, photographs, notes by others, n.d.
B.56
- B.53 'A new Interference Microscope'.
 Photographs by D. Gabor and W.P. Goss.
- B.54- Photographs, notes and graphs from J.M. Burch.
B.56 3 folders.
- B.57, Four patents by others on aspects of optics, 1942-48.
B.58 2 folders.

Research

B.59- MINERAL DRESSING AND RELATED SUBJECTS
B.86

In the 1950s there was a marked shift in Burch's research interests which he discussed in a lecture he gave to the Diamond Conference in 1955:

'Two years ago I decided to start some research on Mineral Dressing, a subject of which I had absolutely no previous knowledge. It all began in Cornwall. I was shown the methods they use in the South Crofty Mine to separate tin oxide from quartz and mica and all the other gangue materials with which it has pleased God to mix it in earth. Considered as a gravity separation problem it seemed comparable with that of separating speculum metal ($\delta = 8.5$) from corborundum ($\delta = 3.2$) with which I was very familiar.' *

The surviving material is far more representative than that for Burch's earlier research interests. It covers the period 1953-80 and includes notebooks, research notes and drafts, and correspondence.

For further material related to Burch's interest in Mineral Dressing, see Section E, especially E.3-E.5 and E.19-E.24.

* As quoted in Memoir, pp.31-32. See C.3.

B.59 Hard-cover notebook entitled 'Mineral Dressing' and dated November 1953. Paginated 1-145, with contents list. Miscellaneous loose papers including notes, graph and letters dated in 1965.

B.60 Hard-cover notebook entitled 'Mineral Dressing' and dated October 1954. Paginated 1-96, with contents list. Miscellaneous loose papers including certificate of analysis and correspondence, 1962-68.

B.61 'Some Experiments in Gravity Concentration'.
12pp. duplicated typescript of lecture to the Cornish Institute of Engineers, 1956, 'recaptured from memory'.

Research

- B.62 'Draft No.2. Full Scale Underground Gasification, using Blind Boreholes'.
5pp.+ 3pp. appendix by C.A. Masterman, 1956.
- 'The Tedman Separator'.
Letter from manufacturers, 18 January 1956; sketch and photographs of
the equipment; Burch's ms. notes, etc.
- B.63- Work at or for the South Crofty Mine, Cornwall.
B.69
- B.63 Correspondence, 1960-69.
- B.64 'Report on Visit of Mr Hamilton and Mr Cruickshank to Crofty'.
7pp. ms., n.d.
- B.65 'South Crofty Hydrosizer'.
4pp. of results, 1962.
- 'Screen Analysis'.
3pp. of results, 1963.
- B.66- Tables of figures and graphs, c.1966-73.
B.69 4 folders.
- B.70 'Electrolysis of Slurries'.
2pp. typescript draft by Burch, November 1964.
- B.71 'Theory of Og Places'.
3pp. ms. draft by Burch, 10 May 1965.
- B.72 'Mozley Concentrators at the Geevor Slime Plant'.
5pp. typescript, c.1967.
- B.73 Ms. notes and graphs: 'Helicoidal Mineral Concentrating & Sizing Units
August 1968-August 1969', 'Kildonan Burn, Panned Gold', 'Suisgill Panned
Gold', etc.

Research

- B.74 'Re-examination of Gold Occurrences, Strath Kildonan, Sutherland, Scotland'.

Field examination for the Geological Survey of Great Britain, n.d.

Brief correspondence from Geological Survey of Great Britain, 1965.
- B.75,
B.76 Graphs, tables, notes, etc., probably related to paper on the normality of some frequency distributions of elements in the Dartmoor Granite, c.1969. (Bibliog. 96.)

2 folders.
- B.77 Graphs re Dartmoor Granite. (Probably related to Bibliog. 96).
- B.78 Burch's comments on C. Lepeltier's 1969 paper 'A Simplified Statistical Treatment of Geochemical Data by Graphical Representation'; 1p. 'further comments' by P.N. Murgatroyd; photocopy of Lepeltier's paper.

Material may relate to Burch and Murgatroyd's joint paper on broken-line and complex frequency distributions. (Bibliog. 98.)
- B.79 'Lognormal and Poisson distributions compared'.

Calculations, tables, graphs, c.1970-71.

'Notes on Post-Sampling Statistics'.

4pp. ms.
- B.80 Reprint of paper by A. Volborth; 7pp. typescript draft and graphs re 'Volborth-Andesite' and 'Volborth-Basalt'.

Material relates to unpublished joint paper with P. C. Rickwood. 1 graph dated December 1971.

See also D.7-D.10.
- B.81,
B.82 Notes, drafts, graphs, etc., c.1971.

Includes 3pp. 'Note on justifying the discard of observed values' and course notes 'Computer methods for geologists' (not given by Burch but some annotated by him).

2 folders.

Research

- B.83 'Professor Young's data', January 1974.
 Graphs, tables of results, etc.
- B.84 'Mineral Concentration - a hydraulic problem', c.1980.
 Ms. draft, notes and graphs.
- B.85,
B.86 Miscellaneous notes, graphs, tables of results, etc., re mineral dressing,
 frequency distribution of minerals.
 2 folders.
- B.87 PYTHAGORAS PATTERNS
- Letter from Nuffield Foundation Mathematics Teaching Project organiser,
 13 September 1967, examples of pythagoras patterns, Burch's ms. notes
 and calculations.
- B.88- WEIRS
B.92
- Burch assisted two colleagues in the Bristol University Civil Engineering
Department (W.H.H. Banks and T.L. Shaw) with the mathematics of fluid flow over a weir.
This resulted in the publication of their 1967 paper 'The design of proportional and logarithmic
thin-plate weirs' (Bibliog. 95). See Memoir, p.35.
- B.88 Ms. and typescript drafts of a paper (with W.H.H. Banks) 'On the Design of
Weirs'. Perhaps early drafts of Bibliog. 95.
- B.89- Ms. notes, calculations, graphs, background material; also letter from Banks
B.92 'enclosing the entire weir flow papers'.
 4 folders.

Research

B.93- HOT-BLAST TORCH DEVELOPMENT
B.95

In Burch's Royal Society Review Lecture of 1965 (Bibliog. 92), he explained how in 1952 'wanting a good brazing torch without added oxygen' he made a hot-blast torch. In the mid-1970s he sought to further development of the torch, approaching both the South Western Gas Company at Bristol and the Midlands Research Station of British Gas at Solihull. He also proposed the development of a large hot-blast torch as a project for third year Bristol Physics students.

B.93 Ms. and typescript drafts of statement on the development of the torch; photocopy of extract from Review Lecture; draft and carbons of Burch's letters to Sir Charles Ellis, South Western Gas and Research Division, British Gas Corporation, 1976.

Folder also includes one earlier (1960) letter re torch.

B.94 Notes and calculations.

B.95 Photographs.

B.96- STATISTICS
B.110

See also D.15-D.27.

B.96 'Howarth Ranked Data', c.1979.

Contents of an envelope so inscribed.

See also B.109.

B.97, 'Non-parametric statistics', c.1980-82.
B.98

Notes, calculations, graphs.

2 folders.

Research

- B.99,
B.100 'Random numbers'.
Tables, graphs, computer print-out. 1p. dated 17 May 1982.
2 folders.
- B.101 'Random 4 Fig Numbers (0000 - 9999)'.
Contents of envelope so inscribed.
- B.102 'Notes on Frequency Distributions and Random Sample Sets', n.d.
14pp. typescript draft.
- B.103 'Further Notes on Post-Sampling Deviation Statistics', n.d.
Ms. draft.
- B.104 'Statistical References'.
2pp. ms.

'Vistelius' Significance test - said to be for Normality'.
3pp. ms.
- B.105 'Note on Confidence Limits for Normal Deviates', n.d.
7pp. typescript.
- B.106 'Dr. Henley's Cold Series', etc.
Graphs, notes, etc.
- B.107 'Statistics of Linear Assays', n.d.
4pp. ms.

'Stirling's Theorem', n.d.
2pp. ms.
- B.108 'KKW₂ (Computer Program), c.1977.
Ms. notes, graphs, print-outs. May relate to work with I.T. Parsons.

Research

B.109 'Ian Howarth-Rank ordering of data', n.d.
Contents of envelope so inscribed.

B.110 'Kolmogorov-Smirnov Statistic', n.d.
Ms. notes, graphs, etc.

B.111- MEDICAL AND PSYCHOMEDICAL
B.165

Burch's interest in medical questions was technological (stethoscopes and pumps used in heart surgery), biochemical (Vitamin B-group therapy and inositol) and psychological (stress, and in particular Burch's response to a mugging incident).

Almost all the surviving material, which is extensive, comes from Burch's last years 1975-82 and relates to biochemical interests. There is however correspondence, 1962-63, with J.M. Sanderson re the heart surgery pump and drafts of Burch's paper 'A Stress Situation - the story of a hold-up' which he sought (unsuccessfully) to have published by various medical journals and finally deposited with the Royal Society. Burch's work on an improved stethoscope is represented in the collection by drafts for a published article at D.5.

Burch's biochemical interests are represented by his drafts on the treatment of sinusitis and gingivitis with B-group vitamins and on inositol deficiency, and by correspondence with doctors and scientific colleagues including R.A. Peters who had been Burch's director of studies at Cambridge. One paper on the treatment of sinusitis and gingivitis was published in The Medical Journal of Australia in 1977 (Bibliog. 102).

B.111- Drafts
B.128

B.111 'Treatment of Nasal Sinusitis by Lavage with B-group Vitamins', [1976].
Typescript drafts; brief correspondence including ms. draft of letter to editor of The Lancet.

B.112 'Treatment of Gingivitis by Massage with Riboflavin', 1976.
Typescript drafts including 'skeleton draft of letter to Lancet and/or British Dental Journal'

Research

- B.113, 'Treatment of Sinusitis and Gingivitis', The Medical Journal of Australia,
B.114 28 May 1977 (Bibliog. 102).
Ms. and typescript drafts; copies of printed article (in form of letter to editor).
Correspondence with editor; correspondence arising from publication.
2 folders.
- B.115 'Pharmaceutical Notes on Nasal Lavage with B-Group Vitamins', 9 July 1977.
Ms. and typescript notes.
- B.116- 'Inositol Deficiency', 1978.
B.119
B.116, Ms. and typescript drafts. 2 folders.
B.117
- B.118, Correspondence with doctors and colleagues, note of telephone conversation
B.119 with R.A. Peters, January 1978.
B.118 B - D B.119 M - P
- B.120 'Inositol Deficiency and Epilepsy', 1978. (Unpublished but listed by
memorialist as Bibliog. 109 'Note sent to the Royal Society').
2 typescript drafts; brief correspondence.
- B.121 'Inositol Supplementation and Epilepsy', 1978.
2 typescript drafts; brief correspondence.
- B.122, 'A Stress Situation - the story of a hold-up', May 1978. (Unpublished but
B.123 listed by memorialist as Bibliog. 104 'Paper sent to the Royal Society').
B.122 Typescript drafts.
B.123 Correspondence with editors of journals and others, 1978-82.
- B.124 'A Stress Situation. Sequel', n.d.
Ms. and typescript drafts.

Research

- B.125 'On Optimal Release from Past Experience', n.d. (Unpublished but listed by memorialist as Bibliog. 107 'Paper sent to the Royal Society'.)
Ms. and typescript drafts; correspondence with Bristol colleague and editors of journals, 1979-80.
- B.126 'The Consultation' and 'A Story with a Moral'.
Ms. and typescript drafts; covering letter to editor of World Medicine, 19 May 1980.

'Onomatherapy'.
Letter to the editor of The Lancet, 5 October 1981.
- B.127 'On the Psychology and Psychotherapy of a Panic Reaction', n.d.
3pp. ms. 'first rough draft'.

'On the Psychology of the Alarm Syndrome and Psychotherapy of its Principal Sequels'.
Ms. draft of essay dedicated to the nursing staff of the Bristol Royal Infirmary.
- B.128 'Some Topical Applications of Laevoascorbic Acid', n.d.
3pp. typescript 'not written for publication'.
- B.129-
B.147 General correspondence on medical and psychological topics presented in an alphabetical sequence.
- B.129 Aldren, J.T. 1975-76

Bevington, G. 1976
Burch's draft only.
- B.130 Bicknell, P.G. 1976-77
Sinusitis treatment.

Research

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|-------|---|------------|
| B.131 | Campbell, M.J.
Burch's draft only. | n.d. |
| | Cates, J.E. | 1975-76 |
| | Proposed conference on Vitamin B-group Deficiency and the Ageing Process;
treatment of sinusitis and gingivitis. | |
| | Chappel, J.B. | 1977 |
| B.132 | Davis, D.R. | 1978, n.d. |
| B.133 | Davis, R. and others | 1978, n.d. |
| B.134 | Eastham, R.D.
Platelet studies. | 1963 |
| | Edwards, R.G. and P.C. Steptoe
Examination of embryos; microscopy. | 1980-81 |
| B.135 | Everett, D.H.
Comfrey. | 1977 |
| | Finn, R. and H.N. Cohen
Food allergy; treatment of epileptic patients with inositol. | 1978 |
| B.136 | Forbes, D.R.
Inositol. | 1978 |
| | Fry,
Streptococci (carbon only of letter from J.P.P. Stock). | 1939 |

Research

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|-------|--|------------|
| B.137 | Grant, R.H.E. | 1978 |
| | Treatment of epileptic patients with inositol (Burch's drafts and photocopies only). | |
| | Himsworth, H.P. | 1962 |
| | Hislop, | 1980 |
| | Burch's drafts only. | |
| B.138 | Hodgkin, D.C.M. | 1976, 1982 |
| | Includes ms. and typescript drafts of note by Burch 'On the Genesis of Arthritis'. | |
| | Huskisson, E.C. and J. Scott | 1978 |
| | Treatment of epilepsy; double blind tests (Burch's draft only). | |
| | Inglis, B. | 1977 |
| | Double blind tests. | |
| B.139 | McElwain, T.J. | 1982 |
| | McVey, A.V. | 1962 |
| | Maendl, A. | 1975 |
| | Vitamin B therapy (Burch's drafts only). | |
| | Medawar, P.B. | 1962 |
| B.140 | Mitchell, J.F. | 1976 |
| | Mitchell, J.P. and others | 1978-79 |
| | Mollin, D.L. and others | 1977 |
| | B12 assays of the blood-serum of amnesiac geriatric patients (Burch's drafts only). | |

Research

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| B.141- | Peters, R.A. | 1975-76, 1978 |
| B.143 | B-Vitamin therapy. | |
| B.141 | April-September 1975 | |
| B.142 | October, November 1975 | |
| B.143 | September-December 1976, January 1978. | |
| B.144 | Read, A.R. | 1975 |
| | Proposed conference on Vitamin B-group Deficiency and the Ageing Process (Burch's drafts only). | |
| | Richards, M.B. | 1975 |
| | Imbalance of Vitamin B factors (Burch's draft only). | |
| B.145 | Sanderson, J.M. | 1962-63 |
| | Pump used in heart surgery. | |
| B.146 | Smith, E.L. | 1977-78 |
| | Inositol; Vitamin B12 deficiency. | |
| B.147 | Swann, M. and D.E.M. Taylor | 1962 |
| | Heart disease and surgery. | |
| | Yakovlef, A.A. and others | 1981 |
| | Use of antioxidants in retinal infections (Burch's draft only). | |
| | Yoffey, J.M. | 1977 |
| | Vitamin B12 deficiency. | |
| B.148 | Correspondence with drug companies, principally relating to therapeutic uses for B-group vitamins, 1976-77, 1982. | |
| | 1982 letter is incomplete. | |
| B.149 | Miscellaneous shorter correspondence, 1962, 1975-77, 1982 and n.d. | |
| | Unindexed. | |

Research

- B.150-
B.155 Analyses of Burch's own medical condition and treatment.
- B.150 'Diet Sheet of C.R. Burch', 23 July 1975.
- 'Present Medication', 3 August 1977.
- B.151 'Supplementary Report of C.R. Burch', n.d.
 Contents relate to neurological episodes, 1974-77, relevant history and
 present medication.
- B.152 'Second Report of Dr. Burch to Dr. Campbell', 20 December 1977.
 Relates to further neurological episodes, present medication, diagnosis, etc.
- B.153 Untitled analyses of Burch's medical condition and treatment, 1977.
- B.154 'An Essay: "On Four Cerebral Episodes"'. Dedicated to Dr. J.E. Cates.
 By The Poor Bloody Patient', n.d.
- B.155 Miscellaneous ms. and typescript notes including 'Supplementary Report on
 Severe Hypoglycaemic Incident, on Sept 25'.
- B.156 Appointment cards, correspondence re visits to hospital, etc.
- B.157-
B.165 Miscellaneous.
- B.157 Notebook. Principally notes from the literature, bibliographical references.
 Latest date, 1981.
- B.158,
B.159 Ms. notes and graphs re ages at death of Fellows of the Royal Society.
 2 folders.
- B.160 Burch's typescript note on A. Davis's Let's eat right to keep fit, c.1976.
 Notes relate to vitamin and mineral deficiency, arthritis, etc.
- B.161 Miscellaneous ms. and typescript notes and drafts.
- B.162 Background material on epilepsy.

Research

- B.163 Background material on inositol.
- B.164 Background material on nutrition.
- B.165 2 papers (1 typescript) on shortwave therapy by J.P.P. Stock.
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- B.166- MISCELLANEOUS
B.185
- B.166- Three black hard-cover notebooks, none dated, possibly from Burch's under-
B.168 graduate period at Cambridge; on various topics in mathematics and physics.
- B.166 Notebook with brief list of contents, headed 'Mathematical' inside front cover.
Contains miscellaneous notes on acoustics, vectors, circuits, etc., and
miscellaneous mathematical calculations. Both ends of book used.
- B.167 Notebook of similar material. No contents page. Includes notes on 'Prof.
Milne's Problem' (probably E.A. Milne FRS) and miscellaneous mathematical
notes and calculations. A few pages used at rear of book.
- B.168 Notebook of similar material, mainly on linear vector operators, waves,
functions. At rear of book, miscellaneous notes and calculations and 3pp.
draft 'On Linear Selecting Systems'.
- B.169 Hard-cover notebook from Bristol period, n.d. but probably 1960s, 1970s.
Contents page. Miscellaneous notes, calculations, tables, bibliographical
references re later work on minerals and statistics. Paginated 1-80 and some
unnumbered pages. 2 loose sheets.
- B.170, Photographs of telescope mirrors, lenses, etc.
B.171 2 folders.
- B.172- Photographs of equipment.
B.174 3 folders.

Research

- B.175- Miscellaneous photographs.
B.177 3 folders.
- B.178- Miscellaneous unattributed ms. notes, graphs, calculations, etc.
B.180 3 folders.
- B.181, Photocopies annotated by Burch.
B.182 2 folders.
- B.183- Publications with superscripts from authors or acknowledging Burch's help.
B.185 3 folders.
- B.186- ADDENDUM: OPTICS
B.200
- B.186 Soft-cover notebook, inscribed on front cover (by Burch) 'Optical Work. Daily Progress Log. Starts 9 July 33. C.R. Burch'. The front cover also has later ms. note by T.E. Allibone 'Metro-Vick Note book to Burch's going to Imperial College Sep 20 and one month in Imp Col.' See Memoir, pp.18-19, where the starting date is given as 8 July 1933. The last entry in the log is for 23 October.
- B.187 Large format hard-cover notebook, inscribed on inside front cover 'C.R. Burch. Imperial College, S. Kensington. Optical Notebook No.(2)' and paginated 1-48. At the front of book is a contents page headed 'On The Production And Testing Of Optical Surfaces'.

This is clearly one of a series of optical notebooks kept by Burch at Imperial College and Bristol of which only nos. 2 and 8 (B.18) survive.
- B.188 Photocopies of published notes re Burch's exhibits of reflecting microscopes at Physical Society Exhibitions, 1939 and 1947.

Research

- B.189 'Optical Scraping'.
3pp. typescript note by Burch, n.d. but incorporates reference dated 1942.
Different 5pp. typescript note with same title, n.d.
- B.190 'Improvements relating to the optical measurement and/or calibration of tubular surfaces'.
Patent application by Burch, M. J. Willcocks and Metropolitan-Vickers Electrical Company, 30 July 1948 (Bibliog. 72).
10pp. typescript; 1 sheet of figures.
- B.191 2pp. typescript carbon paginated 2 and 3, n.d. 1940s.
Subheadings are 'Slit Orientation', 'Integrating Exposure Meter' and 'Gratings and Prisms'.
- B.192-
B.197 Photocopies of Burch's letters to Nuffield Foundation re production of reflecting microscopes, 1949-51.
Burch's letters deal with technical problems and his personal response to being in charge of a production job and reflect on more general questions of research and development.
The photocopies were made for Burch's Royal Society memorialist T.E. Allibone who provides an account of the development and production of the microscope at Bristol (Memoir, pp.26-30).
- B.192 1949, March, June, July
Folder includes list of letters copied by Allibone. The first item, Burch and A.M. Tyndall to H.T. Tizard, 10 December 1947, was not found.
Burch's letter of 18 March 1949 discusses the allocation of the programme's ten reflecting microscopes; letters of July 1949 relate to proposed National Institute of Optics at Bristol.
- B.193 1949, August, September
Folder includes copy of letter to H.H. Plaskett, 5 August, and ms. draft of Burch's report to Warren Committee.

Research

- B.194 1950, June
In letter of 9 June, discussing the matter of exhibiting the microscope in the Festival of Britain, Burch refers to the production job as 'a complete nightmare'. In letter of 20 June Burch considers questions of research and development under such headings as 'Value of a University to a Development Organisation', 'Value of a Development Organisation to a University' and 'Psychology of Development & Research'.
- B.195 1950, September, December
Ms. draft of Warren Report, September and 12pp. letter setting out programme for speeding up production on the ten microscopes, December.
- B.196 1951, January, April, June
Letter of 16 January relates to proposal to accelerate production and the technical situation; letters of 24 April and 6 June relate to a suggested symposium on reflecting microscopes.
- B.197 1951, October, December
Includes draft report to Warren Committee which notes that the first microscope had been handed over to the Anatomy Department at Oxford.
- B.198 Two notes by Burch on the optical work of W.J. Bates. One dated in 1979.
- B.199 'Microscopy of Unstained Specimens'.
Ms. draft of paper by Burch; photocopy of paper and covering letter for W.J. Bates; letter from Bates, 6 May 1980, enclosing photocopy of extract from his thesis.
- B.200 Correspondence re Burch's optics research, 1981 and n.d.

SECTION C

LECTURES AND TALKS C.1 - C.18

- C.1 'The technique of the high-speed cathode-ray oscillograph', for Institute of Electrical Engineers, 2 December 1932.
5pp. typescript abstract; related correspondence.
The accompanying correspondence is initialled 'F.P.B.' (Francis Parry Burch) and the lecture may have been given by him.
- C.2 'A technologist looks at the future', delivered when Burch received the Duddell Medal of the Physical Society, 9 April 1943 (Bibliog. 63). See also A.16.
7pp. typescript draft; reprint of published version.
Includes photocopy of announcement of the award.
- C.3 'Mineral Dressing', delivered at the Diamond Conference 1955 (Bibliog. 81).
2 typescript drafts, each 10pp. 'recaptured from memory'.
- C.4 'Aspheric imaging systems', the Parsons Memorial Lecture delivered 22 October 1959. (Bibliog. 85.)
Reprint copy; brief correspondence.
Folder also includes copy of R.V. Jones's 1971 article 'Complementarity as a way of life', referring to Burch's expanded version of the lecture given in Aberdeen (Memoir, p.33).
- C.5 'Research, creativeness and universities', talk given to the Forum in the Senior Common Room, Bristol University, 17 March 1960 (Bibliog. 86).
2 typescript drafts, 15pp., 12 pp.; brief correspondence.
- C.6 'Aspheric reflecting microscopes and their future', address to the Royal Microscopical Society, May 1961 (Bibliog. 88).
Ms. draft; typescript draft; reprint.

Lectures and talks

- C.7-
C.12 'University physics - the challenge of technology', Royal Society review lecture, delivered 25 March 1965 (Bibliog. 92).
Six folders.
- C.7 15pp. ms. draft, with a few notes of references.
- C.8 Two typescript drafts, 16pp. and 17pp., with a few ms. sheets and 2 typescript lists of slides.
- C.9 Brief correspondence, chiefly with the Royal Society.
Proofs with ms. corrections, reprint of published version.
- C.10-
C.12 Original photographs and diagrams.
3 folders.
- C.13-
C.15 'Application of the plate diagram to reflecting telescope design', delivered at 'Optics 78' Conference organised by the Institute of Physics at Bath University, 20-23 September 1978. Burch's talk was regarded as 'one of the highlights' of the conference (Bibliog. 105).
- C.13 10pp. typescript draft.
- C.14 Shorter notes and drafts; diagrams.
- C.15 Reprint of verbatim report; conference programme and list of participants; letter from organiser.
- C.16 Address given on the occasion of presenting the first British Vacuum Council 'C.R. Burch' Prize, 1981. See also A.22.
Verbatim report, printed in Vacuum, 30, 10-12.
- C.17 Lecture on statistics, probably for a university audience, n.d.
4pp. ms. draft.
- C.18 Invitation to lecture on 'The Separation of Ores' by the Queen Mary College (University of London) Physical Society, 1964.

Invitation to lecture on 'Microscopes and Microscopy' by the Bristol University Microbiological Society, 1980 (declined).

Fragmentary drafts for lectures.

SECTION D PUBLICATIONS D.1 - D.45

- D.1 'An introduction to the theory of eddy-current heating', with N.R. Davis, 1928 (Bibliog. 19; Memoir, p.1).
Publisher's blurb only.
- 'Een radioontvanger met brugfilter', with F.L. Smallpiece, 1932 (Bibliog. 36).
Photocopy of Dutch text; typescript of re-translation.
- D.2 'Improvements in apparatus for short-wave therapy and the like', with C.H. Walker and Metropolitan-Vickers Company Limited, 1940 (Patent, Bibliog. 56, see also Memoir, p.23).
Typescript draft.
- D.3 'Improvements relating to upward current classifiers', with F. Bannister, 1955 (Patent, Bibliog. 80).
Copy of complete specification with covering letter.
- D.4 'Molecular streaming in a circular tube', n.d., c.1960.
4pp. typescript draft; 5pp. notes and calculations.
- D.4A 'Improvements relating to apparatus for separating solid materials in liquid suspensions' (Patent, Bibliog. 87.)
Duplicated typescript, August 1960, with ms. note by T.E. Allibone 'Probably never granted'.
- D.5 'A new "diaphragmatic" stethoscope', with J.P.P. Stock, 1961 (Bibliog. 89).
Typescript drafts of portions of text.
- D.5A 'Contribution to the discussion on paper by I.R.M. Chaston, Gravity concentration of fine cassiterite', 1962 (Bibliog. 90).
Proofs only.
- D.6 'Tests of the normality of frequency distributions of Na, K, SiO₂ and Cl in the Dartmoor granite', 1969-70 (Bibliog. 96).
25pp. typescript draft, 6pp. photocopied graphs.

Publications

- D.7-
D.10 'Joint paper with P.C. Rickwood' discussing 'the inference of rock composition from twin assays of replicate samples of the same specimen', 1971-72. Unpublished. See also B.80.
4 folders.
- D.7 Typescript drafts of letters to P.C. Rickwood, October 1971-March 1972, with accounts of work in hand.
- D.8 11pp. typescript of first draft, November 1971.
5pp. photocopied draft, January 1972.
- D.9 8pp. typescript of third draft, February 1972.
4pp. typescript of 'Statistical Treatment'.
- D.10 Miscellaneous notes, calculations and graphs.
- D.11 Contributed remarks on a paper 'Sampling distribution in South Crofty Tin Mine, Cornwall', by B. Kuseric, T.L. Thomas and J. Pemberly (I.M.M. Transactions, 1973).
Typescript drafts; one graph; photocopy of published text (not listed in Bibliog.).
Folder also includes 3pp. typescript draft 'South Crofty Sampling Problem', 1973.
- D.12 'A Course of Tuition in Mathematics', a "Note" describing tuition given to a candidate hoping to take the Honours B.Sc. course in mining at Cambourne, n.d., 1975 or later.
4pp. typescript draft.

'A Course of Mathematical Tuition', n.d. Expanded, later version, of the above.
10pp. photocopied draft.
- D.13 'A physicist's introduction to calculus', unfinished draft for a proposed book, n.d., c.1976.
10pp. notes and calculations; 8pp. typescript draft.

Publications

- D.14 'Artificial star design', 1976 (Bibliog. 100).
2 typescript drafts, 5pp. and 9pp., 11 graphs, 3pp. calculations.
- D.15- ' "Squeeze" Significance Tests', with I.T. Parsons, 1976 (Bibliog. 101).
D.27
- D.15, Correspondence, principally with I.T. Parsons and the editor of the Journal
D.16 of the Royal Statistical Society, 1974-77.
2 folders.
- D.17 Reprint of paper as published.
- D.18 ' "Squeeze" Significance Tests', 8pp. typescript.
- D.19, ' "Squeeze" Significance Tests for Certain Parameter-free Univariate
D.20 Distributions'.
3 typescript drafts, 8pp., 13pp. and 17pp.; 8pp. graphs not included
in third draft; 9pp. ms. draft.
2 folders.
- D.21 'On a Class of Non-Parametric Test Statistics', 1973.
2 typescript drafts, 10pp. and 5pp.; 8pp. photocopied draft; 4pp. typescript.
- D.22, Miscellaneous notes and narratives, variously titled.
D.23 2 folders.
- D.24 Miscellaneous ms. calculations.
- D.25- Miscellaneous ms. graphs.
D.27 3 folders.
- D.28 'It pays to get theory right', 1978 (Bibliog. 103).
Typescript draft.
- D.29 'An Exposition of the Theory of Relativity', n.d., c.1978.
7pp. ms. notes, calculations and incomplete draft.

Publications

- D.29A 'Newton's Telescope, 1979.
Typescript draft; photocopy of extract from A. Couder's 'Recherches sur les déformations des grands miroirs employés aux observations astronomiques'; brief related correspondence (Burch's carbons only).
- D.30 Comments on Thomas R. Kratochwill's 'Single Subject Research-Strategies for Evaluating Change', 1980.
Typescript, photocopy of ms. draft.
- D.30A 'The knife-edge test for mirrors', 1980 (Bibliog. 106).
Typescript; Burch's carbon of covering letter.
- D.31 'Responsibility for one date', 1982 (Bibliog. 108).
Typescript draft.

D.32- Undated writings
D.44

Some of these may be notes or statements of research in progress, for personal clarification or limited circulation. Others are accompanied by a covering letter to a journal or a newspaper editor, or secretary of a scientific body, and were intended for publication. None are listed in the Bibliography and they were probably not published.

- D.32 'A Solution of the Triangle'.
2pp. draft with 1p. of calculations.

Folder also includes 2pp. photocopied draft of 'A Symmetrical Solution of the Triangle'.
- D.33 'Spherical Triangles'.
4pp. ms. draft.

Publications

- D.34 'Hydrocyclones'.
 2pp. ms. draft.
- D.35 'Rigid Dynamics'.
 2pp. typescript.

 Folder also includes 5pp. ms. entitled 'Dynamics of Rotation of Rigid
 bodies'.
- D.36 'Doughnut Height Curve'.
 2pp. photocopy of tables of figures.
- D.37 'On an Extension of Student's Theorem'.
 3pp. ms. draft.
- D.38 'An Estimate of the Volume of a Teaspoon'.
 1p. ms. draft, 2pp. photocopied draft.
- D.39 'A Test of Normality'.
 2pp. ms. draft; 1p. typescript calculations.
- D.40 'Notes and formulae for errors and statistics course'.
 7pp. typescript draft.
- D.41 'The PseudoScience of Popular Statistics'.
 1p. ms. draft of a letter to the Institute of Physics Bulletin.
- D.42 'The significance of significance coefficients'.
 2pp. ms. draft; ms. draft covering letter to the Secretary, Institute
 of Physics.
- D.43 'A story with a moral'.
 3 versions, all with variations of title, one dated May 1980, and Burch's
 carbon of related letter, December 1981.

Publications

- D.44 "'Sociology" by "R.C. Bierce"' (Burch's chosen pseudonym).
Typescript of poem, written with humorous intent, by Burch, including
list of proposed recipients.
- D.45 Publications of C.R. Burch.
Reprints and photocopies in chronological order, 1925-1980. Not a
complete set.

SECTION E CORRESPONDENCE E.1 - E.48

INTRODUCTION TO SECTION E

Burch's scientific correspondence is both patchy and scant. There are very few substantial sequences of letters and in many cases only Burch's drafts, carbons and photocopies of outgoing letters survive (and some of these are incomplete). The patchiness of the surviving material is due in part to Burch's practice of using the backs of incoming letters for research notes, calculations, etc. Examples of this practice are to be found throughout the collection and especially in Section B.

The material is presented as follows:

- E.1 -E.10 Correspondence on specific topics. In alphabetical order, dated and indexed.
- E.11-E.41 Correspondence with individuals, organisations and firms. In alphabetical order, dated and indexed.
- E.42 Shorter unindexed correspondence.
- E.43-E.48 References and appointments. In chronological order, unindexed.

E.1-E.10 TOPICS

E.1, E.2 'CW communications'.

Correspondence arising from article by R. Skelton 'Some thoughts on CW communications' (Radio Communication, February 1975), 1975.

Burch circulated his papers 'On asymmetric telegraphic spectra' and 'Een radioontvanger met brugfilter' (Bibliog. 33 and 36).

2 folders.

Correspondence

- E.3- 'Helicoids'.
E.5 Miscellaneous correspondence re use of helicoids in mineral concentration, various dates, 1954-69.
3 folders.
- E.3 1954-57
- E.4 1961
Includes results of tests on vibrated helicoid, photographs and diagrams of apparatus.
- E.5 1964, 1966-67, 1969
- E.6 Measurement of time.
Burch's draft letters on this topic; folder also includes Burch's obituary of E.H. Linfoot and brief related correspondence.
- E.7- Mirror-testing.
E.10 Correspondence re Burch's proposal that the British Astronomical Association set up a mirror-testing advisory group, 1979-81.
Burch's concern arose from his work in correcting the defective Charterhouse-on-Mendip Observatory mirror. See B.39, B.40.
4 folders.
- E.7 1979, February-May
- E.8 1979, June
Includes catalogue of telescope manufacturer 'Fullerscopes'.
- E.9 [1979], September.
- E.10 1980-81 and n.d.
Includes copy of minutes of the BAA Instruments and Observing Methods Section Committee Meeting, 30 August 1980.

Correspondence

- E.11-
E.41 INDIVIDUALS, ORGANISATIONS AND FIRMS
- E.11 ARBITER, N. (1963); ARBRÅ VERKSTANDS AKTIEBOLAG (1960);
ASHDOWN, R. (1964).
- E.12 BAGNOLD, R. (1954); BERGNE, J.A'C. (1964); BIRCH, K.G. (1978);
BOWLER, C.M.L. (1960).
- E.13 BRISTOL UNIVERSITY (1951); BRITISH TELECOM INTERNATIONAL (1982);
BURCH, J.M. (1978-79).
- E.14 CAPPER PASS & SON LIMITED (1965); COMBINED OPTICAL INDUSTRIES
LIMITED (1940); COTTLE, B. (1982); CRESSWELL, G. and P.F. NORTON
(n.d.)
- E.15 DRAZIN, (n.d.); EDWARDS, A.W.F. (1970); ELVIS, M. (1976).
- E.16 FABER & FABER LIMITED (1979); FLEMING, M.G. (1960); FLOWERS, T.
(1982).
- E.17 HALL, G. (1981); HAMILTON, J. (1962-63); HATFIELD, H. R. (1975).
- E.18 HOWARTH, I.D. (1978-79); HOWARTH, L. (1977); ISAACS, N. (1955-57);
JEFFERIES, N. (1981).
- E.19-
E.24 JONES, G.H. 1953-63
Principally Jones's letters, on many topics related to minerals and mining,
chiefly in Cornwall.
6 folders.
- E.19 1953 (one letter only); 1954, January-May
- E.20 1954, June-December
- E.21 1955
- E.22 1956, 1957
- E.23 1960, 1963
- E.24 n.d.

Correspondence

- E.25 JONES, R.V. (1974); KING, A.J. (1978); KING, R.W. (1935);
KITTO, H.D.F. (1961).
- E.26 LEONARD, T. (1977); LUDLOW, J.H. (1978).
- E.27 MACKENZIE, J.K. (n.d.); McKERROW, G. (1975, 1978, 1982).
- E.28 MASON, G. (1973); MATTHEWS, R.G. (1954).
- E.29 MERRISON, A.W. (1975, 1978); MORTON, B.R. (1955); MOZLEY, R.
(1967, 1977).
- E.30 ORD, K. (1971, 1973); PILKINGTON BROTHERS LIMITED (1976);
PLASKETT, H.H. (n.d.); POWELL, C.F. (1968).
- E.31- RICKWOOD, P.C. 1964-78
E.37
Principally Rickwood's letters from University of Otago, New Zealand,
and University of New South Wales, Australia, concerning family, career
and matters of scientific interest.
7 folders.
- E.31 1964-65
- E.32 1966-69
- E.33 1970-71
- E.34 1972-76
- E.35 1977-78
- E.36, E.37 Drafts, reprints
- E.38 RING, J. (1977); ROYAL SOCIETY (1955)
- E.39 SIAMESE TIN SYNDICATE LIMITED (1960); STANIER, M. (1977);
SUISGILL ESTATE COMPANY (1969).

Correspondence

- E.40 THOMSON, G.P. (1955); TUBBS, M.R. (1976); VICKERS LIMITED (1973).
E.41 WURTZBURGER, B. (1976); YOUNG, J.Z. (1962); YOUNG, P.A. (1974).
E.42 Miscellaneous shorter scientific correspondence, 1954-78, and undated.
Not indexed.

E.43- REFERENCES AND APPOINTMENTS
E.48

In chronological order, not indexed.

E.43	1960-65	E.46	1976
E.44	1966-68	E.47	1979-80
E.45	1973-74	E.48	1981-82

The bibliography, to which entries in the catalogue are related where possible, is reproduced with permission from T.E. Allibone, Biographical Memoirs of Fellows of the Royal Society, 30, 1984.

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- [2] 1924 Wireless receiving apparatus. Br. Pat. no. 226,050 (14 January).
- [3] (With R. CONNOR & C. T. MELLING) Apparatus for measuring sound-wave frequencies. Br. Pat. no. 234,218 (12 May).
- [4] (With E. Y. ROBINSON) Thermionic rectifier systems for three-phase operation. Br. Pat. no. 243,800 (4 September).
- [5] 1925 (With W. J. BROWN) Wireless signalling. Br. Pat. no. 250,748 (31 March).
- [6] (With J. BLOEMSMA) On an application of the periodogram to wireless telegraphy. *Phil. Mag.* (6) 49, 480-503.
- [7] (With J. BLOEMSMA) Une application du périodogramme à la T.S.F. *Onde élect.*, pp. 1-33.
- [8] (With N. R. DAVIS) High-frequency induction electric furnaces. Br. Pat. no. 251,756 (18 April).
- [9] (With N. R. DAVIS) Circuits for induction heating furnaces. Br. Pat. no. 254,424 (18 April).
- [10] (With N. R. DAVIS) High-frequency induction furnaces. Br. Pat. no. 255,157 (17 April).
- [11] (With N. R. DAVIS) Load-tapping in high-frequency furnaces. Br. Pat. no. 255, 162 (18 April).
- [12] (With N. R. DAVIS) Circuit for induction heating furnaces. Br. Pat. no. 257,021 (25 May).
- [13] (With W. J. BROWN) Aerials and amplifiers for wireless signalling. Br. Pat. no. 268,029 (23 December).
- [14] 1926 (With N. R. DAVIS) On the quantitative theory of induction heating. *Phil. Mag* (7) 1, 768-783.
- [15] (With N. R. DAVIS) Water-cooled electric induction furnaces. Br. Pat. No. 284,774 (3 November).
- [16] 1927 (With N. R. DAVIS) Electricity in the foundry. *Metropolitan-Vickers Gaz.* February, pp. 47-48.
- [17] (With F. E. BANCROFT & METROPOLITAN-VICKERS ELECTRICAL CO.) Improvements in or relating to vacuum distillation. Br. Pat. no. 303,078 (21 September).
- [18] (With F. E. BANCROFT & METROPOLITAN-VICKERS ELECTRICAL CO.) Improvements in or relating to vacuum distillation. Br. Pat. no. 303,079 (21 September).
- [19] 1928 (With N. R. DAVIS) *An introduction to the theory of eddy-current heating*. London: Ernest Benn Ltd.
- [20] (With N. R. DAVIS) Über eisenlose induktionsöfen. *Arch. Elektrotech.* 20, 211-233.
- [21] (With F. E. BANCROFT & ASSOCIATED ELECTRICAL INDUSTRIES LTD) Improvements in or relating to vacuum distillation. Br. Pat. no. 315,186 (19 August).
- [22] (With N. R. DAVIS) Improvements in electric induction furnaces. Br. Pat. no. 317, 931 (5 June).
- [23] Oils, greases, and high vacua. *Nature, Lond.* 122, 729.
- [24] 1929 Some experiments on vacuum distillation. *Proc. R. Soc. Lond. A* 123, 271-284.
- [25] (With F. E. BANCROFT) Values for vacuum apparatus. Br. Pat. no. 329,059 (28 February).
- [26] (With F. E. BANCROFT) Electric glow-discharge tubes for testing vacuum pressures. Br. Pat. no. 333,692 (27 June).
- [27] (With F. E. BANCROFT) Improvements in gas-tight unions for vacuum apparatus. Br. Pat. no. 336,015 (13 July).
- [28] 1930 (With F. E. BANCROFT) Improvements in oil-condensation vacuum pumps. Br. Pat. no. 346,293 (6 January).
- [29] (With N. R. DAVIS) Electric furnaces for steel making. *Metropolitan-Vickers Gaz.* March, pp. 67-70.
- [30] (With N. R. DAVIS & J. H. LUDLOW) Improvements in vacuum electric discharge tubes. Br. Pat. no. 347,210 (20 January).
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- [35] (With N. R. DAVIS, J. H. LUDLOW and A.E.I. LTD) Improvements in vacuum electric discharge tubes. Br. Pat. no. 389,509 (17 September).
- [36] 1932 (With F. L. SMALLPIECE) Een radioontvanger met brugfilter. *Radio Nieuws*, Juli, pp. 87-94.
- [37] (With F. H. PREECE and A.E.I. LTD) Improvements in and relating to high vacuum distillation systems. Br. Pat. no. 396,205 (9 June).
- [38] 1933 (With F. E. BANCROFT) Improvements in vacuum pumps of the condensation or diffusion type. Br. Pat. no. 407,503 (19 January).
- [39] (With F. P. BURCH, J. H. LUDLOW & ASSOCIATED ELECTRICAL INDUSTRIES LTD) Improvements in and relating to vacuum electric discharge tubes. Br. Pat. no. 414,753 (9 February).
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- [41] Address on Zernike's Test for mirrors. *J. Br. astr. Ass.* 44, 328.
- [42] 1935 (With C. SYKES) Continuously evacuated valves and their associated equipment *Jl IEE* 77, 129-146.
- [43] On the zonal Zernike test for paraboloids. *Mon. Not. R. astr. Soc.* 95, 548-554.
- [44] (With R. BEECHING) Warped mirrors. *Observatory Mag.*, pp. 266-270.
- [45] 1936 On reflection compensators for testing paraboloids. *Mon. Not. R. astr. Soc.* 96, 438-461.
- [46] 1937 The Zernike Test. In *Amateur telescope making, advanced* (ed. A. G. Ingalls), pp. 87-103. Munn & Co.
- [47] 1938 Note on compensation of spherical aberration in telescopes. *J. Br astr. Ass.* 48, 115-117.
- [48] Note on improving the covering power of a photographic lens by means of an aplanatising plate. *J. Br. astr. Ass.* 48, 212-215.
- [49] Tolerances permissible in flats for autocollimation tests. *Mon. Not. R. astr. Soc.* 98, 670-672.
- [50] (With C. H. WALKER & METROPOLITAN-VICKERS CO. LTD) Improvements in apparatus for short-wave therapy and the like. Br. Pat. no. 525,425.
- [51] (With J. P. P. STOCK) The rotating electrode for short-wave therapy. *Br. J. phys. Med.* (N. s.) 1, 406-416.
- [52] Apiezon oils. *The Science of Petroleum*, Vol. 4, pt 3. Oxford University Press.
- [53] 1939 (With J. P. P. STOCK) A new dosimeter for short-wave therapy. *Br. J. phys. Med.* 2, 127-133.
- [54] (With W. J. D. VAN DIJK) The theory and development of high-vacuum distillation. *J. Soc. chem. Ind.* 58, 3-6.
- [55] Two reflecting microscopes. *Catalogue of the Physical Society's Exhibition*, September.
- [56] 1940 (With C. H. WALKER & METROPOLITAN-VICKERS CO. LTD) Improvements in apparatus for short-wave therapy and the like. Br. Pat. no. 537,765 (26 April).
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