

Catalogue of the papers and correspondence of

ROBERT WILLIAM DITCHBURN FRS

(1903 - 1987)

Compiled by Peter Harper and Timothy E. Powell

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1988

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<u>LIST OF CONTENTS</u>	<u>Items</u>	<u>Page</u>
GENERAL INTRODUCTION		3
SECTION A BIOGRAPHICAL	A.1-A.43	10
SECTION B PUBLICATIONS AND LECTURES	B.1-B.59	17
SECTION C DIAMOND CONSULTANCY With an introductory note	C.1-C.22	28
SECTION D SCIENTIFIC CORRESPONDENCE	D.1-D.34	33
SECTION E NON-PRINT MATERIAL	E.1-E.11	41
APPENDIX UNDERGRADUATE NOTEBOOKS		43
INDEX OF CORRESPONDENTS		48

GENERAL INTRODUCTION

PROVENANCE

The papers were received in June 1988 from Mrs Doreen Ditchburn and Professor G W Series, FRS , the author of the Royal Society memoir of Ditchburn.

OUTLINE OF THE CAREER OF R W DITCHBURN

Robert William Ditchburn was born in Waterloo, Lancashire, in 1903. He attended Bootle Grammar School (where his father, who graduated in Physics from the University of London, was Headmaster) from 1911. At the age of 16 Ditchburn won a Bibby Scholarship to Liverpool University where he was exempted from the first year course because he held a Higher School Certificate in relevant subjects.

Ditchburn passed the Ordinary Degree in Mathematics and Physics in 1920 and gained his BSc Honours in Physics in 1922. He also was successful in the Cambridge University Scholarship Examination and was admitted to Trinity College the same year. As he already had a degree in Physics Ditchburn was excused Part I of the Tripos. He graduated in 1924.

In 1923 Ditchburn had won a four year Senior Scholarship and this, together with the Isaac Newton Scholarship held 1925-28 and various academic prizes, enabled him to study for his PhD at the Cavendish Laboratory under Sir J J Thomson, its former Head.

Apparently with no great hope of success Ditchburn applied for a fellowship at Trinity College Dublin in 1928. He was in fact elected and a year later was appointed Erasmus Smith's Professor of Natural and Experimental Philosophy at Dublin University. Also in 1929 Ditchburn married Doreen Barrett. They remained in Dublin until 1946, except for three years from 1942 during which Ditchburn served as Principal Experimental Officer at the Admiralty Research Laboratory, Teddington.

Ditchburn returned to England in 1946 to take up the Chair of Physics at Reading University. As Head of the Department he oversaw a considerable growth in the study of physics at the University; from 1946 to his retirement in 1968 the staff of the Department increased from three to over thirty. This expansion, which Ditchburn himself thought his single most important contribution to science, culminated in the opening in 1960 of the J J Thomson Physical Laboratory, built on the new Whiteknights site.

An important field of study of the Physics Department, initiated at the suggestion of Sir Francis Simon in 1953, was diamond research, particularly the investigation of the effects of radiation on diamonds. In the years thereafter the University of Reading was to assume a prominent position in this field.

In 1956 Ditchburn was instrumental in forming an international Diamond Research Committee, acting as chairman from its inception until 1982. He served as a consultant on diamonds to De Beers and helped to establish a sound administrative base for the company's research into synthesising diamonds, a project which was eventually successful.

Ditchburn retired in 1968 though he remained active in the fields of diamond research and optics. He also found time to research the illness of Sir Isaac Newton, disputing the suggestion that he died of mercury poisoning.

At about this time Ditchburn became strongly committed to the Pugwash movement and attended the 1967 conference in Sweden. He produced a number of papers for Pugwash meetings on the subject of armaments and the energy crisis.

Ditchburn's Royal Society memorialist identifies his principal research areas as the photo-ionization of gases and vapours, other absorption processes relevant to the upper atmosphere, the optical properties of solids, (especially diamonds) and the effect of eye movements on visual perception. His most important publication, Light, was first published in 1952 and, with revised editions 1963 and 1976, became a standard textbook dealing with all aspects of the subject.

His interest in eye movements may have been inspired by his wartime research at Teddington. In his later years Ditchburn concentrated on this topic, publishing his second major work, Eye Movements and Visual Perception, in 1973, five years after retirement.

Ditchburn's scientific achievements were recognised with numerous honours and awards. He was elected to the Fellowship of the Royal Irish Academy 1930, serving on its council twice, 1933-1939 and 1942-1943. He was made a Fellow of both the Physical Society (1943) and the Institute of Physics (1949). In 1952-1955 he was on the council of the Physical Society and was vice-president 1958-1960, delivering the Society's Thomas Young Oration in 1959. Ditchburn then served a further two years as vice-president of the newly-merged Physical Society and Institute of Physics.

He was elected a Fellow of the Royal Society 1962 and served on several of its committees. He was also on the British National Committees for Physics, Astronomy and Radio-Science and the National Subcommittee for Optics 1948-1966 (chairman from 1961). In addition to these and other positions and honours Ditchburn was a Fellow of the Optical Society of America and in 1983 was awarded the prestigious C E K Mees Medal for his contribution to optics research.

For a full account of the life and career of Ditchburn see G W Series' Royal Society memoir 'Robert William Ditchburn 1903-1987', on which the above outline has freely drawn.

DESCRIPTION OF THE COLLECTION

The material is presented in the order given in the List of Contents. The collection, although small in size, offers a respectable amount of biographical material, material relating to Ditchburn's principal publications and diamond research at Reading and some scientific correspondence.

Section A, Biographical, consists of Ditchburn's own material relating to his career, including curricula vitae and a typescript copy of his 'Reminiscences' for The Making of Physicists, and letters containing the recollections of colleagues, students and friends sent to G W Series while he was compiling the Royal Society memoir. The final draft of the memoir is at A.1.

Section B, Publications and Lectures, comprises a chronological sequence of notes, drafts, correspondence and other material relating to Ditchburn's publications and lectures. Unfortunately his university lectures and seminars are represented only by B.4, a notebook for lectures given by Ditchburn probably while professor at Trinity College Dublin.

There is a considerable body of material relating to the English language editions of Light (B.8-B.30).

At the end of the sequence is a small subsection (B.57-B.59) devoted to Ditchburn's work for the Pugwash movement, principally papers and lecture notes on armaments and energy.

Section C, Diamond Consultancy, is a chronologically presented sequence of, mainly, correspondence between Ditchburn and colleagues in South Africa regarding progress in research at Reading.

Section D, Scientific Correspondence, consists of letters arranged alphabetically by correspondent, chiefly about light and vision. It includes a 1935 letter from Sir J Chadwick (D.8) thanking Ditchburn for recommending him for the Nobel Prize in Physics which he received that year. Also of interest is a letter Ditchburn sent in 1975 to the Burmah Oil Company suggesting that their investment in research into achieving nuclear fusion through laser systems was unlikely to have any commercially viable result (D.6).

At D.12 is 1970 correspondence with D Fishlock, science correspondent of the Financial Times, who enquired about a second world war government campaign encouraging the consumption of carrots as an aid to night vision.

Section E, Non-print material, is largely group photographs taken at various conferences. There is also a photograph of students at the Cavendish Laboratory 1927 (E.1). E.11 is a tape-recording of a lecture by Ditchburn on Sir J J Thomson.

The appendix reproduces with permission Liverpool University Archives' catalogue of Ditchburn's undergraduate notebooks..

LOCATIONS OF FURTHER MATERIAL

The University of Liverpool Archives hold 7 notebooks dating from Ditchburn's undergraduate courses 1920-22 (D.367). See appendix.

The Manuscripts Department of Cambridge University Library possesses an early undated notebook recording experiments (Add. MS 8637).

The Admiralty Research Establishment holds a collection of papers relating to Ditchburn's wartime research there.

Mrs Ditchburn retains a little personal material.

ACKNOWLEDGEMENTS

We are very grateful to Mrs Doreen Ditchburn for making available her husband's papers, and to Professor G W Series for a draft of his Royal Society memoir and the material assembled for it.

Peter Harper
Timothy E Powell
Bath 1988

SECTION A

BIOGRAPHICAL

A.1 - A.43

- A.1 - A.8 Biographical and Autobiographical
A.9 - A.27 Career, Honours and Awards
A.28 - A.43 Material re Royal Society memoir of Ditchburn

Biographical and Autobiographical

- A.1 'Final' draft of G W Series's Royal Society memoir of Ditchburn. 39pp typescript with a few ms additions and corrections.
- A.2 The Times obituary of Ditchburn, 15 April 1987.
Obituary in University of Reading Bulletin, May 1987.
Obituary for Ophthalmic and Physiological Optics.
5pp typescript with ms note '2nd half of 1987 or early 88'.
- A.3 Curriculum vitae with notes on papers published.
4pp typescript, 14 January 1960.
Curriculum vitae, 1p typescript, 1969 or later.
- A.4 Requests for biographical information, 1966-81 and nd, with information provided by Ditchburn.
- A.5 - A.8 'Reminiscences', The Making of Physicists, Adam Hilger, 1987.

Ditchburn was the first of eighteen senior physicists who recounted their student days for The Making of Physicists.

Biographical

- A.5 'Reminiscences by R.W.Ditchburn', 9pp typescript.
- A.6 Correspondence, chiefly with the History of Physics Group of the Institute of Physics who commissioned the book, July - November 1985.
- A.7 Correspondence with the History of Physics Group re recollections of the Kapitza Club, September - November 1986.
- A.8 Publicity material re The Making of Physicists, with covering letter.

Career, Honours and Awards

- A. 9 University of Liverpool 1919-22. Award of Bibby scholarship, testimonials and degree certificates.
- A.10 Trinity College Cambridge 1924-25. Menu for Sexcentenary of Michaelhouse Commemoration Dinner, Michaelmas 1924; correspondence with Sir J J and Lady Thomson.
- A.11 Trinity College Cambridge 1926-27. Quarterly bill from Trinity College; invitation from Sir J J and Lady Thomson to meet P Painlevé, the French mathematician and politician; testimonials (probably for Ditchburn's application to Trinity College Dublin) from Sir J J Thomson (2), R Vere Laurence and R H Fowler.
- A.12 Letter from A S Eddington re a vacancy in Australia for a Chief Assistant at the Commonwealth Solar Observatory, Canberra, 21 February 1928.
- A.13 Trinity College Dublin 1928. Newspaper cuttings recording Ditchburn's election as Fellow; letters of congratulation from Lord Rayleigh and L R Wilberforce; letter from J L Synge offering to nominate Ditchburn for the Fellowship of the Royal Irish Academy.

Biographical

- A.14 Letter from E Rutherford with advice on 'organising the Course' at Trinity College, 23 April 1929.
- A.15 Material re application for Chair of Physics, Birmingham University, 1936.
- Includes letters from J Chadwick, Rutherford and Thomson promising support.
- A.16 Letter from Lord Rayleigh agreeing ~~to~~ to give Ditchburn 'a reference for the Aberdeen post', 31 January 1945.
- Letter from C P Snow (Tutor, Christ's College Cambridge) re the possibility of Ditchburn returning to Cambridge, 15 June 1945.
- A.17 Material re appointment to Chair of Physics, Reading University, 1946.
- Includes typescript copy of Ditchburn's curriculum vitae and letter of congratulation from J A Crowther, whom he succeeded.
- A.18 Menu for Trinity College Cambridge Annual Gathering Dinner, 16 June 1953.
- A.19 Correspondence re Ditchburn's resignation as a Home Office Regional Scientific Adviser for Civil Defence, May 1955.
- A.20 Material re the opening of the J J Thomson Physical Laboratory 1960, and its 25th Anniversary 1985.
- A.21 - A.24 Election to Fellowship of the Royal Society.
- A.21 Telegram informing Ditchburn of his election and letter from H W Florey, PRS, inviting him to lunch at the Society, 15 March 1962.
- Mrs Ditchburn's ms list of those from whom congratulatory letters and telegrams were received.

Biographical

- A.22 - A.24 Letters and telegrams of congratulation. In alphabetical order.
- 3 folders.
- A.25 Correspondence with H D Kramer re Ditchburn's acceptance of a Senior Foreign Scientist Fellowship offered by the US National Science Foundation, 1964.
- A.26 Telegrams and letter sent to Ditchburn upon his retirement, July 1968.
- A.27 Optical Society of America.
- Letter informing Ditchburn of his election to Fellow Emeritus, 8 December 1981.
- Photocopy from Physics Today, November 1983, re award of the Society's C E K Mees Medal to Ditchburn.

Material re Royal Society memoir of Ditchburn

- Correspondence assembled by G W Series during the preparation of his Royal Society memoir, the final draft of which is at A.1.
- A.28 Correspondence from Mrs Ditchburn to Series.
- Copy of letter sent by Series to colleagues of Ditchburn requesting recollections.
- A.29 - A.43 Correspondence with friends and colleagues of Ditchburn, and with institutions with which he was associated, arising from Series's request. In alphabetical order.

Biographical

- A.29 Admiralty Research Establishment, Teddington, re Ditchburn's wartime research on optics.
- A.30 Allibone, T E.
- Blakemore, C, re significance of Ditchburn's work on physiology of optics.
- A.31 British Pugwash Group, re Ditchburn's contribution to Pugwash. Includes copy of obituary from Pugwash Newsletter, 1987.
- Clark, C D, re Reading University.
- A.32 Dyer, H B, re Ditchburn's (and Reading University's) contribution to the diamond industry. Includes 4pp typescript essay with tributes from Dyer, F C Frank and D Tabor and 2pp typescript list of postgraduate students from Reading who studied diamonds for their Ph.Ds.
- A.33 Evans, T, re Reading University and De Beers consultancy.
- Fellgett, P B, re Reading University.
- Frank, F C, re Diamond Conferences and Pugwash.
- A.34 Gregg, A H, re Trinity College Dublin. Includes 3pp typescript recollections.
- A.35 Heavens, O S. Includes an obituary written for Physics Bulletin, July 1987.
- Heddle, D W O, re Reading University.
- Holt, J C. Gives permission to Series to use extracts from his The University of Reading: the first fifty years (1976), with formal letter from Reading University to the same effect.

Biographical

- A.36 Hopkins, H H. Letter re Ditchburn's role in Optica Acta and correspondence with Mrs Ditchburn and Royal Society re unpublished paper by Ditchburn on 'Nuclear Winter'.
- A.37 Institute of Physics re Ditchburn's role in both the Institute and the Physical Society. Includes 2pp photocopy of the citation for the award of the 1959 Thomas Young Oration.
- A.38 Kelly, A, re Reading University.
Lang, A R, re Diamond Research Conferences.
Marr, G V, re Reading University.
- A.39 Mills, I M. Includes address delivered at Ditchburn's funeral.
- A.40 Oxford University Press. Permission to quote from Ditchburn's two contributions to The Oxford Companion to the Mind.
Pitt, H.
- A.41 Royal Irish Academy. Material re Ditchburn's membership of the Academy including photocopies of his certificate of candidature and list of his papers published in the Academy's Proceedings.
- A.42 Seaton, M J. Includes note on Ditchburn's work on photo-ionization.
Smith, S D. Includes note on research at Reading.

Biographical

A.43 Steele, J P, re Trinity College Dublin.

Walton, E J S.

Wright, W D.

Wynne, C G.

SECTION B

PUBLICATIONS AND LECTURES

B.1 - B.59

B.1, B.2	Bibliographies
B.3 - B.56	Publications and Lectures
B.57 - B.59	Pugwash Movement

Bibliographies

- B.1 Typescript lists of publications.
- B.2 Typescript list of papers on 'Eye Movements and Vision with Stabilised Images' and 'vacuum spectroscopy' published by members of the Reading University Physics Department, including Ditchburn.

Publications and Lectures

- B.3 Letter from Sir J J Thomson re a series of draft papers Ditchburn had sent him. Thomson advised him 'to send these papers as they stand'. 15 November 1932.
- B.4 Loose leaf notebook with ms lecture notes, probably for Ditchburn's Trinity College Dublin courses. 1935-1947.
- B.5 Notebook with Ditchburn's ms notes on various subjects including 'The place of Technique in Science and Art' which may have been the basis for his published lecture of 1939 'The technician in art, science and industry'.

Publications and Lectures

- B.6 Admiralty Research Laboratory, 'Interconversion tables for photometric units', 27 October 1944. 2pp typescript + 3pp tables.
- B.7 Admiralty Research Laboratory, 'The uses of red and orange light in the Services', 6 June 1945. 35pp typescript + 1p index, 2pp references, 1p table, 9pp figs.

Light

- | | | |
|------------|--------------------------------|------|
| B.8 - B.14 | First edition, Blackie and Son | 1952 |
| B.15-B.23 | Second edition, Blackie | 1963 |
| B.24-B.30 | Third edition, Academic Press | 1976 |
- B.8 - B.14 First edition
- B.8 Outline plan, 1p typescript; contract with Blackie, July 1945; letter from publishers, 20 December 1946.
- B.9 Outline plan of Light, 15pp typescript with ms annotations. Found with the contract.
- Ms notes on previous books by other authors on light.
- B.10 Ms notes beginning 'Consider a sphere of radius a containing N molecules with an assigned molecule at the centre O'. 4pp. Not in Ditchburn's hand but found with material re Light (1st ed.).
- B.11 Booklet advertising Light; reviews of Light, 1953; letter from Ditchburn re corrections and alterations, 30 September 1954.

Publications and Lectures

B.12 - B.14	Correspondence with publishers and readers arising from publication of first edition, 1958-64. Arranged alphabetically. 3 folders.	
B.15 - B.23	Second edition	
B.15	List of journals to receive review copies of <u>Light</u> . Reviews of second edition of <u>Light</u> , 1963-65 and nd.	
B.16 - B.23	Correspondence <u>re</u> second edition arranged alphabetically.	
B.16	Blackie and Son Ltd.	1963-70
B.17	Braddick, H J J , <u>re</u> revision of <u>Light</u> in view of Bellevue Conference. Emeleus, K G , <u>re</u> ambiguities in <u>Light</u>	1957 1964
B.18	Eno, R Free, J, <u>re</u> spectra of energy Hargreaves, C M	1965 1965 1966
B.19	Heavens, O S Hopkins, H H Institute of Physics and Physical Society	1963 1962 1960

Publications and Lectures

B.20	Long, J F, <u>re</u> reference to single photon interference.	1967
	Mykura, H	1966
B.21	Robinson, E, <u>re</u> experiments on diffraction of light through cloth.	1965
B.22	Smith, R A	1960
	Speer, R J, <u>re</u> EUV grating study.	1965
	Taylor, A M , <u>re</u> Taylor's review of <u>Light in Contemporary Physics</u> .	1963
B.23	Thames and Hudson Ltd	1963
	Walsh, J W T	1960
	Wapniarsky, W J	1963
B.24 - B.30	Third edition	
B.24	Plates for <u>Light</u> .	
B.25	Prefaces for third edition, 4pp typescript.	
B.26 - B.30	Correspondence <u>re</u> third edition arranged alphabetically.	
B.26, B.27	Academic Press Inc	1971-75
	Academic Press published the third edition after Blackie and Son declined to issue a revised edition.	
	2 folders	

Publications and Lectures

- | | | |
|------|--|---------|
| B.28 | Blackie and Son Ltd | 1971 |
| B.29 | Heavens, O S | 1973-81 |
| | Heavens contributed a number of short sections to the third edition. The correspondence chiefly concerns the subjects that should be covered and the payment of royalties. | |
| B.30 | Miscellaneous correspondence. | 1977-80 |
| B.31 | Letter from J L Synge on a note, 'Representation of an unstable particle', sent him by Ditchburn. Synge claims to be 'quite incompetent to judge' but suggests Ditchburn 'go ahead and publish it and see what happens!' 15 February 1954. | |
| | With copy of the note dated 1 February 1954, 4pp typescript. | |
| B.32 | Brief correspondence from P Rosbaud, July 1960, enclosing letter from Sir G P Thomson declining editorship of book. Both Rosbaud and Thomson express the hope that Ditchburn would be willing to undertake this task. | |
| B.33 | Correspondence with the Television Society <u>re</u> invitation to give the 1966 Fleming Memorial Lecture, June-August 1965. | |
| | Ditchburn declined the invitation because of a visit abroad. | |

Publications and Lectures

- B.34 'Eye Movements', Encyclopaedia of Linguistics, Information and Control, 1969.

Letter from editor thanking Ditchburn for his article,
10 June 1966.

- B.35 - B.39 'Joseph John Thomson, Nobel Prize in 1906', 1968.

Ditchburn was approached by Fratelli Fabbri Editori,
an Italian publishing company, to write an article on
Thomson for a volume on Physics Nobel prizewinners.
Thomson was Ditchburn's supervisor at the Cavendish
Laboratory 1924-28.

Found with drafts of the article and related correspondence
were memorabilia of the 1926 Cavendish Laboratory
celebrations (B.37-B.39). Further material relating to
Thomson may be found at A.10, A.11, A.15, B.3 and B.42,
with a tape-recording of a lecture by Ditchburn on Thomson
at E.11.

- B.35 Correspondence with Fratelli Fabbri Editori; contract
for article; note accompanying payment of fee.
April - December 1968.

- B.36 'Joseph John Thomson, Nobel Prize for Physics 1906'.
Two slightly different 12pp typescript copies of article.

- B.37 - B.39 Memorabilia of the 1926 Cavendish Laboratory celebration.

1926 saw both the seventieth anniversary of the foundation
of the Laboratory and Sir J J Thomson's seventieth birthday.
The two events were celebrated together.

- B.37 Menu for Cavendish celebration, 18 December 1926.

Publications and Lectures

- B.38 'Cavendish Laboratory Supplement', Nature,
18 December 1926.
- B.39 Reproductions of signatures of past and present workers
in the Cavendish Laboratory, bound in hard covers and
labelled 'J J T 1856-1926'.

Presented to Thomson in recognition of his 'contributions
to theoretical and experimental physics'.
- B.40 Letter from Royal Netherlands Academy of Arts and Sciences,
9 May 1973, re publication of papers read at symposium on
Light and Sight.

Two 'Comments' on points raised at symposium, 2pp typescript.
- B.41 Eye Movement and Visual Perception, Clarendon Press, 1973.

Reviews 1973-75, with letter from L A Riggs re his review
for Contemporary Psychology, 23 July 1974.
- B.42 'Reminiscences of the Cavendish Laboratory 1922-28',
Physics Bulletin, 1977.

5pp typescript.
- B.43 'Thomas Smith, FRS', Dictionary of National Biography
Supplement 1961-1970.

Request from editor for a notice of Smith's life,
February 1978; 'final copy' of Ditchburn's draft, 2pp
typescript + 1p typescript notes for editor; letter to
Ditchburn from J Preston with 3pp ms notes on Smith;
photocopy of 'appreciation' of Smith by K J Habell.
- B.44 Correspondence with P B Fellgett, April, August 1978,
re two articles by Ditchburn and A E Drysdale published
in Proc. Roy. Soc, 1977 and 1978.

Publications and Lectures

- B.45 'The relation between retinal-image movement and rotation of the eye', Optica Acta 26 (1979).

Abstract only.
- B.46 'The function of small saccades', Vision Research 20 (1980).

4pp typescript.
- B.47 Ditchburn's ms notes on 'Parallel Visual Pathways: a review', by P Lennie, Vision Research 20 (1980).

4pp.
- B.48 - B.53 'Newton's Illness of 1692/3', Notes and Records of the Royal Society 35 (1980).

Ditchburn disputed the conclusion reached in two 1979 articles in Notes and Records that Newton's death resulted from mercury poisoning, putting forward an alternative case that he died of a breakdown brought on by clinical depression.

As Ditchburn held the Isaac Newton Scholarship at Cambridge 1925-28, his interest in Newton was fitting.
- B.48 Correspondence with J M A Lenihan re the use of hair samples to obtain evidence of mercury poisoning, 1979.

Includes copies of two articles by Lenihan, 'Hair and History' and 'Mercury and Man'.
- B.49 Ms notes on Newton's health.
- B.50 Ms notes on clinical depression.

Publications and Lectures

- B.51 Ms notes and background information on mercury poisoning.
- B.52 Miscellaneous correspondence re Ditchburn's article, including letter from M Wolbarsht, co-author of article maintaining the mercury poisoning theory.
- B.53 Photocopies and cuttings re the debate on Newton's death.
- B.54 Copy of letter from W M Dalton to editor of Encyclopaedia Britannica, 20 October 1984, re errors in entries on 'electromagnetic radiation' and 'light', the latter being a contribution by Ditchburn.
- B.55 Letter to B W Petley in which Ditchburn mentions his interest in optical experiments on relativity in connection with a book he is writing, 7 May 1985.
- The book, Optics, written with O S Heavens was nearing completion at the time of Ditchburn's death.
- B.56 'Stabilization of Retinal Images', The Oxford Companion to the Mind, OUP, 1987.
- Correspondence re illustrations, 14 January 1987.

Publications and Lectures

Pugwash Movement

Ditchburn attended his first International Pugwash Conference in 1967 at Ronneby in Sweden. He also attended the 1972 Oxford Conference and that held in Munich 1977, at which he gave a paper on 'Factors which Determine the Level of Armaments' (B.58). Ditchburn also contributed to two international Pugwash symposia in London 1980 and 1985. He was an active member of the British Pugwash Group and it was at one of their meetings on 8 April 1987 that he suffered a fatal heart-attack.

The material includes two papers delivered by Ditchburn to international Pugwash meetings, together with a number of undated papers and sets of lecture notes.

See also A.31.

- B.57 Letter appealing for funds sent out by Ditchburn as 'the "youngster" in the UK Pugwash Executive', 1979.
- B.58 Typescript drafts and notes.
- 'Factors which Determine the Level of Armaments', Pugwash Conference, Munich, 1977, 5pp + 1p abstract.
- 'Assessment of Dangers in New Weapons', Pugwash Symposium, London, 10-12 December 1980, 4pp (photocopy), last page missing.
- Untitled draft on nuclear weapons, nd, 2pp.
- Notes on nuclear energy, nd, 1p.

Publications and Lectures

B.59 Ms lecture notes.

'Nuclear Energy and Governmental Problems', nd, 7pp + 1p
list of slides.

'Energy Policy', nd, 2pp.

'Alternative Scientific Programmes', nd, 3pp.

SECTION C

DIAMOND CONSULTANCY

C.1 - C.22

From 1955 Ditchburn, and many of his colleagues and students in the Physics Department of Reading University, undertook consultancy work for Industrial Distributors (1946) Ltd, a subsidiary of the South African mining company De Beers.

Among the projects with which Ditchburn was associated was the attempt to emulate the success of the General Electric Company (GEC) of America in synthesising diamond, which had been subject to US government embargo because of its strategic significance. Ditchburn was able to recommend to De Beers an administrative structure for the project, which greatly contributed to its success in 1959.

H B Dyer of De Beers, in an account sent to Ditchburn's Royal Society memorialist, described the diamond research conducted by Ditchburn and his Physical Properties of Materials Group at Reading as '.... the single most important contribution by a single institute to this subject'. (A.32).

Ditchburn was also a founder member of the Diamond Research Committee 1956-86, serving as chairman to 1982, and played a major part in the Diamond Conferences which it organised.

The material, chiefly correspondence between Ditchburn and Industrial Distributors' Diamond Research Laboratory in South Africa, is presented in a chronological sequence 1954-69. The catalogue entries indicate the principal topics of the correspondence.

Diamond consultancy

- C.1 1954
- Coloration and decoloration of diamonds by irradiation; increasing diamond fluorescence ('sparkle') by surface chemical treatment.
- Includes 'Report on diamond polishing' by H B Dyer, 4pp typescript.
- C.2 1955
- Coloration and decoloration of diamonds; synthesising diamonds.
- Includes letters re GEC's and ASEA Sweden's attempts to produce artificial diamonds, March.
- C.3 1956
- Patenting of new decoloration process for blue diamonds.
- C.4 1957 Jan-May
- Coloration and decoloration of diamonds; 1957 Diamond Conference.
- Includes notes on discussions between P J Oppenheimer, W A Chapple and Ditchburn re 'Reading Scheme', 3pp typescript. With report by Ditchburn on diamond research at Reading, 5pp typescript.
- C.5 1957 June-Sept
- Patent for decoloration of blue diamonds; 1957 Diamond Conference.
- C.6 1957 Oct-Dec
- Acquisition of specimens of synthetic diamond from GEC; Diamond Research Committee; polarisation of luminescence in diamond; absorption edge spectrum of diamond.

Diamond consultancy

- C.7 1958 Jan-May
- Diamond Research Committee; efforts to acquire specimens of synthetic diamond from ASEA Sweden.
- C.8 1958 Aug-Dec
- New metal evaporation technique; patenting of diamond coloration process.
- C.9 1959 Jan-June
- Chemical coloration of diamonds; 'Stigma' research programme.
- C.10 1959 July-Nov
- Diamond Conference 1959; irradiation of diamonds.
- C.11 1960 Jan-May
- Diamond Research Committee .
- Includes report on diamond research at Reading University, 3pp typescript + 3pp list of papers 1952-60, and summary of paper 'The Anisotropy of Magnetoresistance in semiconducting diamond' by P J Kemmey and E W J Mitchell, 1p typescript.
- C.12 1960 June-Oct
- Framesite; irradiation of diamonds.
- C.13 1961 Jan-Mar
- Visit to UK by J F H Custers, Director of Research at the Diamond Research Laboratory; annealing radiation damage in diamonds.
- Includes letter dated 24 February on Sir Gordon Sutherland's announcement to the Royal Society the previous evening that the National Physical Laboratory had successfully synthesised diamonds.

Diamond consultancy

- C.14 1961 Apr-July
- E M Wilks's research programme at Reading; 'Moissan's diamonds'.
- C.15 1961 Aug-Oct
- 'Chemical' method of drilling diamonds; patent on production of artificial diamonds; coloration of diamonds.
- Includes 'The coloration of small diamond brilliants by electrical bombardment' by J F H Custers and F A Raal, 6pp typescript + 1p captions + illustration, and 'Electronic properties of diamond' by E W J Mitchell, a report on research topics at Reading, 5pp typescript.
- C.16 1961 Nov-Dec
- Early attempts to synthesise diamonds.
- Includes 'Comments by C D Clark on "Coloration of Diamonds by Electron Irradiation" ', 4pp typescript.
- C.17 1962
- Colour measurement of diamonds.
- C.18 1964
- T Evans's attempt to bond diamond particles by plastic deformation.
- C.19 1965
- Plastic deformation of diamond.
- C.20 1967
- Letter and abstracts from S K Dickinson re his research on diamonds, 18 December.

Diamond consultancy

C.21 1968

'Proposals for the continuation of financial support for diamond work at Reading', 10pp duplicated typescript.

C.22 1969 and nd

Ditchburn's copies of covering letters sent with diamonds returned to South Africa, 3 February 1969.

'Replies to the questions asked about surface properties of diamond', nd, 5pp typescript with ms note 'Joint with Trevor E[vans]'.
'

SECTION D SCIENTIFIC CORRESPONDENCE

D.1 - D.34

- D.1-D.3 Arnulf, A 1950

 Re night vision. 3 folders.
- D.4 Bach-y-Rita, P 1970

 Includes note on V S S system for Bach-y-Rita.
 lp typescript.
- Blackie and Son Ltd 1969-70

 Re reprinting Roberts' Heat and Thermodynamics.
- D.5 Blume, S S 1966

 Branton, P 1984

 Re Rapid Eye Movements (REMs).

 Broderick, ?T S 1942

 Re problem of statistical methodology.
- D.6 Buchsbaum, G 1985

 Re colour perception.

 Burmah Oil Co.Ltd 1975

 Re laser fusion.

 Burr, D C and Morrone, M C 1982

 Butler, C C 1967
- D.7 Campbell, F W 1985

 Includes note on 'Shadows of the Retinal Blood
 Vessels', 2pp ms + 2pp ms diagrams.

Scientific correspondence

D.8	Chadwick, J	1935
	Chadwick thanks Ditchburn for recommending him to the Nobel Committee. He received the Nobel Prize for Physics 1935.	
	Clark, C D	nd
	Constable and Co. Ltd.	1966
	Cotton, ? A	1949
D.9	Cratchley, E M	1966
	<u>Re</u> producing variations in colour on stretched film by sound waves.	
	Dale, S	1967
D.10	Dyson, J	1966, 1973
	Principally <u>re</u> flash tubes.	
D.11	Einstein, A	nd
	Photocopy of letter to E Pringsheim <u>re</u> polarisation of resonance radiation.	
	Emeleus, K G	1967
	<u>Re</u> scattering of light.	
D.12	Eric Bateman and Partners	1981
	<u>Re</u> lenses.	
	Fellgett, P B	1976

Fishlock, D

1970

Fishlock, Science Editor of The Financial Times, wrote to Ditchburn enquiring about the scientific basis for the claim, made during a second world war government campaign, that eating carrots aided night vision. Ditchburn replied that through experiments it was ascertained that the average

Scientific correspondence

D.12 cont'd

Fishlock, D 1970

Fishlock, Science Editor of The Financial Times, wrote to Ditchburn enquiring about the scientific basis for the claim, made during a second world war government campaign, that eating carrots aided night vision. Ditchburn replied that through experiments it was ascertained 'that the average change [in night vision] was favourable but was not statistically significant'.

D.13 Franck, J 1927

Re pressure-broadening of spectral lines and Doppler effect.

Gaardner, K 1965

Garlick, G F J 1976

Re shadows of retinal blood vessels

D.14 Ginsborg, B L 1980

Glazebrook, R T nd

Letter to Ditchburn written between 1929, the date Ditchburn was made Professor at Dublin University, and 1935, the year of Glazebrook's death.

D.15 Goldberg, L 1966

Granit, R A 1967

Card thanking Ditchburn for his congratulations on Granit's receipt of the Nobel Prize for Medicine.

Gunn, A D G 1976

Scientific correspondence

- | | | |
|------|---|------------|
| D.16 | Harper, W R | 1946 |
| | Letter <u>re</u> Harper's reconsideration of 'my diffraction paper' ('On the obliquity function to be used in the approximate theory of diffraction', <u>Proceedings of the Cambridge Philosophical Society</u> 25 (1929)). | |
| | With 5pp typescript notes 'Mature reflections on Proc. Camb. Phil. Soc. 25 (1929)', and reprint of original paper with Harper's ms corrections and additions, 1946. | |
| D.17 | Hilger and Watts Ltd | 1967 |
| | Hopkins, H H | 1972 |
| | Innisfree Electronics for Cathode Ray Images | 1982 |
| | <u>Re</u> C R T Image Generator. | |
| D.18 | Institute of Physics | 1978 |
| | <u>Re</u> reducing the size of the Institute's committee structure. | |
| | Jenkins, ?I G | 1960 |
| | Kantor, W | 1967 |
| D.19 | Kelly, D H | 1978, 1980 |
| | Includes letter of thanks for Kelly's hospitality during visit to California, 1980. With notes on papers by Kelly, 2pp typescript. | |
| | Lindberg, D C | 1978 |
| | <u>Re</u> Lindberg's book <u>Theory of Vision</u> . With note on the camera obscura, 1p typescript. | |

Scientific correspondence

D.20	Logvinenko, A	1975
	Mackay, D M	1980
	<u>Re</u> paper by Mackay in <u>Vision Research</u> 19 (1979).	
	MacLeod, D	1980
D.21	Medical Research Council	1965-66
	<u>Re</u> project F A I R (Fast Access Information Retrieval).	
	Motz, H	1983
	Copy of letter from P B Fellgett <u>re</u> draft of Motz's paper 'A Model for the Electrosimulation of the Nervus Acusticus, which Motz originally sent to Ditchburn.	
	Nissel and Co. Ltd	1981
	Peelle, R W	1974-75
D.22	Pickford, R W	1966
	<u>Re</u> anomaloscope.	
	Pigassou, R	1976
	Pike, E R	1980
	<u>Re</u> damage threshold for lasers.	
	Includes calculation on damage threshold, 2pp typescript.	
	Pirenne, M H L	1966

Scientific correspondence

D.23	Precision Optics Ltd	1972
	Riggs, L A	1982
	<u>Re</u> Riggs' receipt of Ives Medal; measurement of eye movements during a blink.	
	Robson, J	1978
	Rogers, G L	1980
	<u>Re</u> system to 'back off' the natural curvature of the cornea.	
D.24	Rosenfeld, A R	1977
	<u>Re</u> testing spectacle lenses.	
	See also D.31	
	Royal Society	1974, 1976
	Includes 1976 National Academy of Sciences of USA 'Affirmation of Freedom of Enquiry and Expression' circulated to all members of Royal Society, with Ditchburn's letter to Lord Todd, PRS, explaining why he felt unable to sign the declaration.	
D.25	Schmidt, M J	1978
	<u>Re</u> scleral contact lenses.	
	Seal, M	1981
D.26-D.28	Searle, G F C	1947
	Principally <u>re</u> optical fringes and wedges.	
	3 folders	

Scientific correspondence

D.29	Series, G W	1972
	Sheppard, N	1980
	<u>Re</u> Royal Society memoir of Sir Gordon Sutherland, note on Sutherland's work on diamonds.	
	Smith, R A	1971
	Spillmann L A	1976
	<u>Re</u> stabilized vision.	
D.30	Thomson, J J	1932
	Troscianko, T	1981
	<u>Re</u> the Hermann grid illusion.	
D.31	Whitcomb	1970
	<u>Re</u> testing strength of lenses.	
	See also D.24	
	Wright, W D	1972
D.32,D.33	Wynne, C G	1958
D.32	<u>Re</u> Babinet's Principle, with 2pp typescript note.	
D.33	Material found with above, in folder labelled 'Physical Optics - Misc.'	
	'The diffraction of light by a transparent cylinder immersed in a medium of nearly the same refractive index', 3pp typescript.	
	Photograph, unidentified.	
	2pp ms calculations headed 'Obstacle Microscope'.	

Scientific correspondence

D.34	Zikmund, V	1970
	<u>Re</u> dedication of book <u>Slovensko vo fotografii</u> by K Plicka to Ditchburn.	
	Unidentified	1951
	<u>Re</u> zone-plate.	
	With 'selection of figures' headed 'X-zone-plate', 2pp typescript.	

SECTION E NON-PRINT MATERIAL

E.1 - E.11

- E.1 Group photograph of members of the Cavendish Laboratory 1927.
- Four colleagues are identified on the back, [H J J]Braddick, Paul White, [W A H] Rushton and [C G C] Chesters. The photograph is dated May 1926 and 1927 in different hands. The latter is probably correct; Rushton only returned to Cambridge (where he had been an undergraduate) in 1927 from University College Hospital London and neither he nor Chesters signed the Cavendish Laboratory tribute to Sir J J Thomson in 1926 (B.39).
- E.2 Photographs taken at the Inaugural meeting of the Preparatory Committee of the International Commission for Optics, Prague, 2 June 1947.
- Includes group photograph with key.
- E.3 Group photograph of the Conference on the Properties of Semi-Conducting Materials, Reading University, 10-15 July 1950.
- E.4 Photographs from Sir James Chadwick's seventy-fifth birthday party, 20 October 1966.
- E.4A Group photograph with signatures of those present.
- E.5 Group photograph of EGAS Conference, 1971.
- E.6 Group photograph of the International Symposium for Synchrotron Radiation Users, Daresbury Nuclear Physics Laboratory, Lancs, 5-7 January 1973.
- E.7 Group photograph of the 47th Pugwash Symposium on Strategic Defences, London, 5-8 December 1985.

Non-print material

- E.8 Photographs found in envelope inscribed 'Visit of Physical Society to Pye's in Cambridge', nd.

 Includes group photograph.
- E.9 Group photograph of International Commission for Optics Conference, ? Germany, nd.

 With key.
- E.10 Mounted photographs and diagrams of the 'Reading normal incidence vacuum monochromator (UV)'.
- E.11 Tape-recording of Ditchburn's 'Lecture on J J T'.

APPENDIX

UNDERGRADUATE NOTEBOOKS

The University of Liverpool archives holds seven notebooks compiled by Ditchburn while an undergraduate at the University 1920-22, and has provided the following listing which is reproduced here by permission.

Notebooks compiled by Professor Robert W. Ditchburn, F.R.S. whilst a student on the Practical course for the Honours B.Sc. in Physics, 1920-21, deposited by Professor Ditchburn (B.Sc. Maths and Physics 1920, B.Sc. Hons. in Physics 1922), 9 Summerfield Rise, Goring, Reading, RG8 ODS, 2 June 1986, and 13 June 1986, and 20 February 1987.

D.367

Notes

1. Professor Ditchburn entered the University in October 1919 at the age of 16 years, having attended Bootle Secondary School and obtained the Higher School Certificate (in Maths, Physics and Chemistry, with French as Subsidiary) in 1917. By permission of the Faculty of Science Professor Ditchburn was exempted from the Intermediate B.Sc. examination and was allowed to sit the Final Examination for the B.Sc. (Pass Degree) in Maths and Physics in June 1920, which he passed First Class. The degree of B.Sc. Honours in Physics was conferred on Professor Ditchburn in July 1922. During Session 1923-24 Professor Ditchburn was a registered external research student, working on 'the atomic nucleus'. During Sessions 1919-20 to 1921-22 inclusive Professor Ditchburn held a Bibby Scholarship (see The University of Liverpool Calendar 1919-20 p.431) and also a Pennington (Peace) Scholarship [awarded by Bootle County Borough Council].

Undergraduate notebooks

2. Professor Ditchburn was successively Professor of Natural and Experimental Philosophy in Dublin University, 1929-46, and Professor of Physics at the University of Reading, 1946-68. He became a Fellow of the Royal Society in 1962.

For fuller details see the entry for Professor Ditchburn in Who's Who 1986, p.471.

Professor Ditchburn contributed his Reminiscences (of his student career at Liverpool and Cambridge), as chapter one, to Rajkumari Williamson (ed.), The Making of Physicists (Adam Hilger, Bristol, 1987).

3. For a few more details about the Physics courses see the Faculty of Science Prospectus of Courses Session 1920-21. The University of Liverpool's Calendar 1920-21 indicates that, apart from Professor L.R. Wilberforce, the following were then the members of the academic staff of the Department of Physics: Mr. J. Rice (Senior Lecturer), Mr. R. Ablett and Mr. E. Edwards (Demonstrators and Junior Lecturers), and Mr. J.E. Crackston (Oliver Lodge Fellow). Professor Ditchburn believes that the Practical course which he took was supervised by Professor Wilberforce and Mr. Ablett. The notebooks provide no evidence of the names of the supervisors (who occasionally tick the results of the experiments) with the sole exception of Experiment No.11 which is ticked by J.E.C. [Crackston], 25 April 1921.
4. Professor Ditchburn thinks that he had about 10 lecture notebooks in all, but that he does not think there is any likelihood that he will locate further volumes.
5. D.367/7 was, with the agreement of Professor Ditchburn, transferred by the Keeper of Archives and Manuscripts, University of Reading, in February 1987. Professor Ditchburn deposited this volume with the Keeper on 21 June 1967 (ref. Acc. No.544) whilst he was Professor of Physics at the University of Reading.
6. The death of Professor Ditchburn was recorded in the 11 May 1987 issue of Precinct (University of Liverpool).

Undergraduate notebooks

D.367/1-2 Notebooks (illustrated by diagrams, graphs, etc.)
compiled by Professor Ditchburn whilst a student
on the Practical course for the Honours B.Sc. in
Physics, Session 1920-21:-

1. Notes on the method followed in writing up the results of the experiments, followed by notes on the experiments (the following brief details being taken from the list of contents of the volume):- (1 vol.)

1. Elasticity of a copper wire
 2. Viscosity
 3. Self-Induction
 4. Mutual Induction
 5. Coefficient of Restitution
 6. Newtons Rings
 7. Cardinal Points
 8. Surface Tension
 9. Frequency of Fork
 10. Low Resistance (a) Lord Rayleigh's method
(b) Lord Kelvin's method
 11. Focal Length of Objectives
- Covers period from 12 Oct.1920 up to
17 Feb. 1921.

2. Notes on experiments (the following brief details being taken from the list of contents of the volume):- (1 vol.)

12. Diffraction Phenomena
13. Fresnel's Biprism
14. Thermoelectric E.M.F.
15. Resistance of Electrolyte (Kohbrausch's method)
16. Capillary Electrometer
17. Hysteresis (Magnetometer)
18. Hysteresis (Ballistic)
19. Resolution of Telescope
20. Quarter Wave Plate
21. Convergent Light Polariscopes
22. Conductivity of Metal Bar
23. Thermoelectricity
24. Conductivity of Glass
25. Indices of Iceland Spar
26. Saccharimetry
27. Focal Line
28. Focal Planes and Principal Planes of a Ramsden Eyepiece

Covers period 21 Feb. 1921 onwards.

Loose in the volume: typescript (carbon copy)
instructions for conducting an experiment to
determine the velocity of light by measurement
of the ratio of the electro-magnetic to the
electro-static unit of capacity, n.d.

Undergraduate notebooks

- D.367/3 Notes on lectures given on Course F [Mathematical Physics] in the Department of Physics, (1 vol.)
27 Oct. 1920, 3 Nov. 1920, and n.d.
[Oct. and Nov. 1920].
- Loose in the volume: two sheets of notes on [a] lecture given on the same course, 29 Nov. 1920.
- Above the name of R.W. Ditchburn at the front of this volume appears the signature of 'Alex Irving'. Professor Ditchburn cannot recollect Mr. Irving but presumes that he must have given him a part-used notebook, the first few pages of this notebook having been cut out. [There appears to be no reference to Mr. Alex Irving as a student at the University : there is no Student Dossier for him and he does not appear in the lists of graduates given in the Calendars.]
- D.367/4 Notes on lectures given on Course F (1 vol.)
[Mathematical Physics] in the Department of Physics,
10 Dec. 1920 (sic) ('Tensors (cont.)' [continued from notes on undated lecture Tensors in D.367/3], 12 Oct. 1920, and 19 Nov. 1920.
- Across a majority of the pages is written "Copied" indicating that a fair copy of the notes was later made.
- These notes are written in a "Notes of Lectures. University of Liverpool" notebook bought from Philip, Son and Nephew, Ltd., University Booksellers, 3, Bedford Street, N., Liverpool.
- D.367/5 Notes (a) on lectures "XXIII - XXIX" on (1 vol.)
Magnetism and Electromagnetism
[probably given by Mr. James Rice, Senior Lecturer in Physics]
on pages paginated 1-201, the odd numbered pages only being used for these particular lectures.
n.d. [?1921-22]
- (b) on lectures X - XXI on Magnetism and Electromagnetism on pages paginated 128-2, the even numbered pages only being used for these lectures (e.g. 128, 126, 124, etc.)
n.d. [? 1921-22]
- Loose in the volume: notes on "reciprocal M. Lauberts for five point graphs" (1 sheet)

Undergraduate notebooks

- D.367/6 Notes on lectures [I] - IV and unnumbered (1 vol.)
on Electro-magnetic Theory, Dispersion,
and Magneto-optics, [probably given by
Mr. J. Rice subsequently to those in
D.367/5] n.d. [? 1921-22]

At the back of this volume (which is numbered
"II") are:-

- (a) Notes [on a lecture on] "some mathematical
theorems", and
- (b) Notes on Professor H.A. Lorentz's "Rede"
Lecture on Maxwell's Electromagnetic Theory,
delivered at Cambridge on 15 May 1923.

- D.367/7 Notes on lectures given in the Department (1 vol.)
of Physics:-

(a) (pp.1-219, odd numbered pages only
being used)
Electricmagnetic Theory lectures [I] - VI
given by Mr. James Rice, [Senior lecturer
in Physics]. 12 Jan.1921 - n.d. [?Feb.1921]

(b) (pp.124-234, even numbered pages only
being used; start at the other end of the
volume to (a)).
Note on the Telegraphic Equation, n.d. [?Feb.1921],
followed by notes on lectures on Physical
Optics,
4 march 1921 -11 March 1921, and brief
notes on Lecture X on Convergent Light,
17 March 1920.

These notes are written in a notebook on
which the name and coat of arms of The
University of Liverpool appear on the
cover.

INDEX OF CORRESPONDENTS

ACADEMIC PRESS	B.26, B.27
ADAM HILGER LIMITED	A.6, A.8
ADMIRALTY RESEARCH ESTABLISHMENT	A.29
ADRIAN, Richard Hume, 2nd Baron	A.22
ALLEN, John Frank	A.22
ALLEN, K W	A.22
ALLEN, Percival	A.22
ALLIBONE, Thomas Edward	A.30
ANDREW, Edward Raymond	A.22
APPLETON, Sir Edward (Victor)	A.22
ARNULF, A	D.1 - D.3
BACH-Y-RITA, Paul	D.4
BARKETT, R G	A.22
BARNARD, Howard Clive	A.22
BARTLETT, Sir Frederic (Charles)	A.22
BARUCH, P	A.22
BATES, Sir David (Robert)	A.22
BATES, Leslie Fleetwood	A.22
BENNET-CLARK, Thomas Archibald	A.22
BERMAN, Robert	A.22

Index of correspondents

BLACKETT, Patrick Maynard Stuart, Baron	A.22
BLACKIE AND SON LIMITED	B.8,B.12,B.16 , B.28, D.4
BLACKMAN, Moses	A.22
BLAKEMORE, Colin	A.30
BLEANEY, Brebis	A.22
BLUME, S S	D.5
BOWDEN, Bertram Vivian, Baron	A.22
BOWDEN, (Frank) Philip	A.22, C.12
BRADDICK, Henry John James	A.22, B.17
BRADLEY, R S	C.9, C.10, C.15
BRAGG, Sir (William) Lawrence	A.22
BRANTON, Paul	D.5
BRITISH PUGWASH GROUP	A.31, B.57
BRODERICK, ?T S	D.5
BROWN, E T S	C.1-C.4, C.8, C.11-C.13, C.16
BUCHSBAUM, Gershon	D.6
BULLARD, Sir Edward (Crisp)	A.22
BUNTING, Arthur Hugh	A.22
BURCH, Cecil Reginald	A.22, C.4, C.5

Index of correspondents

BURCHAM, William Ernest	A.22
BURMAH OIL COMPANY LIMITED	D.6
BURR, D C	D.6
BUTLER, Sir Clifford Charles	D.6
CALNAN, E A	A.22
CAMPBELL, Fergus William	D.7
CARTER, W E	A.22
CHADWICK, Sir James	A.15, A.22,D.8
CHAPPLE, W A	C.4
CHARNOCK, Joan (née Thomson)	A.22
CHASSON, Robert L	B.30
CHESTERMAN, W Deryck	A.22
CLARK, Colin D	A.31, C.5, C.10, C.16 C.22, D.8
CLOWES, Max	A.18
COCKCROFT, Sir John (Douglas)	A.22, A.23
CONN, G K T	A.22
CONSTABLE AND COMPANY LIMITED	D.8
CORMACK, James Maxwell Ross	A.22
COTTON, ?A	D.8
COTTRELL, Sir Alan (Howard)	A.22

Index of correspondents

COULSON, Charles Alfred	A.22
CRATCHLEY, Elizabeth M	D.9
CROWTHER, James Arnold	A.17
CUSTERS, Jan Frans Henri	A.22, C.1-C.19
DALE, Alfred	A.9
DALE, Simon	D.9
DALTON, Walter M	B.54
DAVIS, E R	A.22
DICKINSON, Stanley K	C.20
DIESEL, L A G	A.22
DIMMICK, J	A.22
DOBINSON, Charles Henry	A.22
DOWN, Wilfred	A.22
DUCKHAM, Alec Narraway	A.22
DYER, Henry B	A.22,A.26,A.32,C.1, C.5,C.14
DYSON, James	A.22,D.10
EDDINGTON, Sir Arthur (Stanley)	A.12
EINSTEIN, Alfred	See D.11
ELLISON, M A	A.23

Index of correspondents

ELTON, Lewis Richard Benjamin	A.23
EMELEUS, Karl George	B.17, D.11
ENO, Ralph	B.18
EVANS, Christopher	A.26
EVANS, Trevor	A.33, C.9,C.15,C.18,C.19
EWALD, Paul Peter	A.23
FELLGETT, Peter Berners	A.33,B.44,D.12, D.21
FENDER, Derek Henry	A.23, A.26
FLOREY, Howard Walter, Baron	A.21
FLOWERS, Brian Hilton, Baron	A.23
FOWLER, Sir Ralph Howard	A.11
FRANCK, James	D.13
FRANK, Sir (Frederick) Charles	A.23,A.32,A.33
FREE, John	B.18
GAARDNER, Kenneth	D.13
GABOR, Dennis	A.23
GARLICK, George Frederick John	A.23,D.13
GEBBIE, Alastair	A.23

Index of correspondents

GINSBORG, Bernard L	A.23,D.14
GLAZEBROOK, Sir Richard (Tetley)	D.14
GOLDBERG, L	D.15
GOSSAGE, R J	A.29
GRAHAM, Alastair	A.23
GRANIT, Røagnar Arthur	D.15
GREGG, A H	A.34
GUGGENHEIM, Edward Arnold	A.23
HAINE, M E	A.23
HALE, Sir Edward	A.23
HARGREAVES, C M	B.18
HARPER, W R	D.16
HEAVENS, Oliver Samuel	A.35,B.19,B.29
HEDDLE, Douglas William Orr	A.35
HERZBERG, Gerhard	A.23
HIRSCH, Sir Peter (Bernhard)	A.23
HODGSON, P E	A.23
HOLT, James Clarke	A.35
HOPKINS, Harold Horace	A.36,B.19,D.17
HORA, F B	A.23

Index of correspondents

INDUSTRIAL DISTRIBUTORS (1946) LIMITED	C.1-C.19, C.22
INSTITUTE OF PHYSICS	A.6,A.7,A.23,A.24,A.37 B.19, D.18
IRESON, M J	B.30
JACKSON, Willis, Baron	A.23
JENKINS, ?I G	D.18
JERVIS, B W	B.30
JOHNSON, Arnold	A.23
JONES, Frank Llewellyn	A.23
JONES, Harry	A.23
KAISER, T R	A.23
KANTOR, Wallace	D.18
KEELEY, Thomas Clews	A.23
KELLY, Anthony	A.23, A.38
KELLY, D H	D.19
KELLY, J C	C.8
KEMMER, Nicholas	A.23
KNIGHT, Bert Cyril James Gabriel	A.23
KRAMER, Howard D	A.25
KUHN, Heinrich Gerhard	A.23

Index of correspondents

LANG, Andrew Richard	A.23, A.38
LAURENCE, Reginald Vere	A.11
LENIHAN, John M A	B.48
LINDBERG, David C	D.19
LIPSON, Henry Solomon	A.23
LOGVINENKO, Alexander	D.20
LONG, J F	B.20
LONSDALE, Dame Kathleen	A.23
McCREA, Sir William (Hunter)	A.23
MacDONALD, David Keith Chalmers	A.23
MacKAY, Donald McCrimmon	D.20
MacLEOD, D	D.20
MALCOLM, Gp Capt. John E	B.13
MARR, Geoffrey V	A.38
MARTIN, Sir David (Christie)	A.23
MARTIN, Thomas	A.19
MATTHEWS, Sir Bryan (Harold Cabot)	A.23
MEDICAL RESEARCH COUNCIL	D.21
MENDELSSOHN, Kurt Alfred Georg	A.23
MENZIES, Alexander Charles	A.23

Index of correspondents

MILLER, A R	A.23
MILLS, Ian M	A.39
MILLS AND BOON LIMITED	B.13
MITCHELL, Edgar William John	A.23,C.5,C.6,C.8-C.10, C.14,C.15,C.20
MITCHELL, George Hoole	A.23
MOON, Philip Burton	A.23
MORGAN, Joseph	B.14
MORRONE, M C	D.6
MORTON, Richard Alan	A.23
MOTT, Sir Nevill (Francis)	A.23
MOTZ, Hans	A.23, D.21
MYKURA, H	B.20
NABARRO, Frank Reginald Nunes	A.23
OLDFIELD, Richard Charles	A.23
"OPIK, U	A.23
OPTICAL SOCIETY OF AMERICA	A.27
OXFORD UNIVERSITY PRESS	A.40, B.56
PARNES, Robert	B.14
PATON, Sir William (Drummond Macdonald)	B.52
PEELLE, R W	D.21

Index of correspondents

PETLEY, B W	B.55
PICKERING, Frederick Pickering	A.24
PICKFORD, Ralph William	D.22
PIGASSOU, Renée	D.22
PIKE, Edward Roy	D.22
PIPPARD, Sir (Alfred) Brian	A.24
PIRENNE, Maurice Henri Leonard	D.22
PITT, Sir Harry (Raymond)	A.40
PORTER, Laurence E	A.24
POWELL, Cecil Frank	A.24
PRECISION OPTICS LIMITED	D.23
PRESTON, George Dawson	A.24
PRESTON, John S	B.43
PRICE, William Charles	A.24
PRINGSHEIM, Ernst	D.11
PRUE, J E	A.24
PRYCE, Maurice Henry Lecorney	A.24
PURCELL, Ronald Herbert	A.19
RADÓ, Richard	A.24
RANDALL, Sir John (Turton)	A.24
RATCLIFFE, John Ashworth	A.24

Index of correspondents

RAWLINS, Francis Ian Gregory	A.24
RAYLEIGH, Robert John Strutt, 4th Baron	A.13, A.16
RAYNOR, Geoffrey Vincent	A.24
REDMAN, Roderick Oliver	A.24
RIGGS, Lorrin A	A.24, B.41, D.23
ROBINSON, B W	A.24
ROBINSON, Eric	B.21
ROBSON, John	D.23
ROCHESTER, George Dixon	A.24
ROGERS, Gordon L	D.23
ROSBAUD, Paul	B.32
ROSENFELD, A R	D.24
ROYAL IRISH ACADEMY	A.41
ROYAL NETHERLANDS ACADEMY OF ARTS AND SCIENCES	B.40
ROYAL SOCIETY	A.21, B.51, D.24
RUSHTON, William Albert Hugh	A.24
RUTHERFORD, Ernest, Baron	A.14, A.15
SANDERS, Sir Harold George	A.24
SCHMIDT, Marty J	D.25
SCOTT-BLAIR, George William	A.24
SEAL, Michael	D.25

Index of correspondents

SEARLE, George Frederick Charles	D.26 - D.28
SEATON, Michael John	A.42
SERIES, George William	A.24, D.29
SHENSTONE, Allen Goodrich	A.24
SHEPPARD, Norman	D.29
SISSON, George M	A.24
SMITH, Robert Allan	A.24, B.22, D.29
SMITH, Stanley Desmond	A.42
SNOW, Charles Percival, Baron	A.16
SOCIETY FOR VISITING SCIENTISTS	A.24
SPEER, Robert John	B.22
SPILLMANN, Lothar A	D.29
SPRING, Kenneth H	A.24
STANDARD TELECOMMUNICATIONS LABORATORIES LIMITED	C.17
STEELE, J P	A.43
STILES, Walter Stanley	A.24
SUTHERLAND, Sir Gordon (Brims Black McIvor)	A.24
SUTTON, Sir (Oliver) Graham	A.24
SYNGE, John Lighton	A.13, B.31
TABOR, David	A.32, B.51
TAYLOR, (Alfred) Maurice	B.22
TAYLOR, Wilfred	A.24

Index of correspondents

TELEVISION SOCIETY	B.33
THAMES AND HUDSON LIMITED	B.23
THOMPSON, Sir Harold (Warris)	A.19
THOMSON, Sir George (Paget)	A.24, B.30
THOMSON, Sir Joseph John	A.10,A.11,A.15,B.3,D.30 See also B.35-B.39, E.11
TITZ, Miloš	B.30
TODD, Alexander Robertus, Baron	D.24
TOLANSKY, Samuel	A.24, C.16
TROSCIANKO, T	D.30
UNITED KINGDOM ATOMIC ENERGY AUTHORITY	C.8
VICK, Sir Francis Arthur	A.24
VON ENGEL, Alfred Hans	A.24
WALSH, J W T	B.23
WALTON, Ernest Thomas Stinton	A.24, A.43
WAPNIARSKY, W J	B.23
WEAVIND, R G	C.4,C.5,C.9,C.12,C.15
WEISSLER, Garry	A.24

Index of correspondents

WILBERFORCE, Lionel Robert	A.9, A.13
WILKINSON, Sir Denys (Haigh)	A.24
WILKS, Eileen M	A.24, C.13, C.14
WOLBARSHT, Myron L	B.52
WOOSTER, W A	A.24
WRIGHT, (William) David	A.24, A.43, D.31
WYNNE, Charles Gorrie	A.43, D.32, D.33
ZIKMUND, V	D.34
ZVEGINTZOV, M	A.24