

Catalogue of the papers and correspondence of

Lawrence Rickard Wager FRS

(1904 - 1965)

by Jeannine Alton, Timothy E. Powell and
Nicola Ashbridge

NCUACS catalogue no. 84/5/99

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LIST OF CONTENTS

		Items	Page
GENERAL INTRODUCTION			5
SECTION A	BIOGRAPHICAL AND PERSONAL	A.1-A.133	11
SECTION B	EXPEDITIONS AND RESEARCH	B.1-B.478	27
SECTION C	UNIVERSITY OF READING	C.1-C.15	99
SECTION D	UNIVERSITY OF DURHAM	D.1-D.29	102
SECTION E	UNIVERSITY OF OXFORD	E.1-E.73	107
SECTION F	RESEARCH TOPICS	F.1-F.39	118
SECTION G	LECTURES, SPEECHES AND ADDRESSES	G.1-G.89	125
SECTION H	PUBLICATIONS	H.1-H.109	137
SECTION J	SOCIETIES AND ORGANISATIONS	J.1-J.27	152
SECTION K	REFERENCES AND RECOMMENDATIONS	K.1-K.31	159
SECTION L	CORRESPONDENCE	L.1-L.94	163
SECTION M	NON-TEXTUAL MATERIAL	M.1-M.117	178
APPENDIX	PERSONAL AND GEOLOGICAL DIARIES	APP.1-APP.69	187
INDEX OF CORRESPONDENTS			199

GENERAL INTRODUCTION

PROVENANCE

The papers were received at various dates 1998-1999 and represent a consolidation of material previously diffused among several sources. Wager had been one of the three scientists chosen in 1969 for the pilot project that led to the formation in 1973 of the Contemporary Scientific Archives Centre (now the National Cataloguing Unit for the Archives of Contemporary Scientists). A selection of his papers and diaries, made and listed by Miss J.M. Pye under the direction of Professor Margaret Gowing, was deposited in the Archives of the Royal Society in 1969. A considerable amount of material was returned at that time to family hands, while much of Wager's research notes, maps and teaching material remained in the Oxford Department of Geology and Mineralogy (now Earth Sciences). With the approval of Mrs Wager and her family, the Council of the Royal Society and the Departmental authorities, all these deposits have been assembled and integrated into the present collection.

OUTLINE OF THE CAREER OF LAWRENCE RICKARD WAGER

Wager was born on 5 February 1904 in Batley, Yorkshire. He was educated at a local elementary school and then at Hebden Bridge United District Grammar School, where his father was Headmaster. Walking, exploring, climbing and early geologising occupied his boyhood, forming his interests and a lasting attachment to the Yorkshire Dales, where he later purchased a house, still in family hands. In 1916, when Wager was twelve, his mother died and in 1919 his father may have been in indifferent health since he was granted a year's leave of absence from teaching, which he spent with the two boys (Wager and his younger brother Hal) in the West Indies. Here climbing, geology and botanising continued. From 1920 to 1923 Wager attended the sixth form of Leeds Grammar School, living with an aunt and uncle (Harold Wager FRS) and obtaining an Exhibition to Pembroke College Cambridge. He read the Natural Sciences Tripos, graduating with a First in Geology in 1926, and began research on Yorkshire Limestones, supported by a Goldsmiths Company Research Scholarship. Throughout his Cambridge period he was an active member of the University Mountaineering Club (President 1925-1926), climbing in Britain and the Alps and establishing a wide reputation for steadiness and a reliable eye for terrain.

His parallel skills as a geologist and climber-explorer were to characterise Wager's career. He was appointed Lecturer in mineralogy and petrology at the University of Reading in 1929 and played his part in teaching and field excursions of the department. But he also participated in the major expeditions that resulted in important scientific discoveries and personal fame. The first of these

expeditions, to Greenland in 1930-1931, was the occasion of his recognition and pioneer survey of the igneous intrusions of the East Greenland coastal mountain area between Angmagssalik and Kangerdlugssuaq. The study of this area - reinforced by subsequent expeditions in 1932, 1934, 1935-1936 and 1953 - was the focus of virtually all his scientific research.

The expedition to Everest in 1933 brought a different kind of celebrity. Wager and P. Wyn Harris were chosen to lead the final assault on the summit on 29 May 1933; in adverse weather, they were not successful but they reached a greater height than any previous climbers until the successful ascent by Hilary and Tenzing twenty years later in 1953.

During the Second World War Wager was commissioned in the Royal Air Force and served in the Photographic Interpretation Unit until his release in 1944 to take up the Chair of Geology at the University of Durham. In 1950 he moved to Oxford where he greatly expanded the Department of Geology and Mineralogy. Wager was determined to enhance the status of geology at Oxford and argued for its recognition as a school and entrance subject. He also established the Geological Age and Isotope Research Group (GAIR) for the study of geochronology and geochemistry, in which a new graduate course was introduced.

Wager died very suddenly on 20 November 1965 at the relatively early age of sixty-one.

In 1934 Wager married Phyllis Margaret Worthington, who achieved a notable 'first' in accompanying him to East Greenland on the 1935-1936 expedition, which he led; she and her sister-in-law (Hal Wager's wife Kit) became the first British women to over-winter there.

Wager was elected to the Fellowship of the Royal Society in 1946. He received many medals and honours: the Polar Medal 1933, the Mungo Park Medal of the Royal Scottish Geographical Society 1936, the Bigsby Medal of the Geological Society of London 1945, the Spendiarov Prize of the International Geological Congress 1948 and the Lyell Medal of the Geological Society of London 1962.

Wager, a reticent man, answered to several names. His given name, Lawrence, was used by his immediate family and less generally by university colleagues; more formal colleagues of an earlier generation preferred the surname Wager; in his department he was 'Prof' or 'LRW'; Oxbridge and mountaineering friends of the 1920s and 1930s use the affectionate 'Waggers' characteristic of the period; more confusingly, his brother-in-law E.B. Worthington bestowed on him the name 'Bill', originally to be used on his Morris Dancing excursions, and this became his most usual name for the rest of his life among both family and friends, although Wager apparently regretted it. For a time, at Reading, he was nicknamed 'George', but this was a short-lived complication.

DESCRIPTION OF THE COLLECTION

The material is presented as shown in the List of Contents. It covers the period 1904-1985. In addition to the description of the material given below, fuller introductory matter may be found at the beginning of most of the sections.

Section A, Biographical and personal, includes a little material from Wager's schooldays and his early notebooks of natural history and geological observations. His later appointments and applications for posts are also recorded. There is relatively little documentation for the later part of his career. Of interest are the annotated memorabilia of his clubs and societies, the careful account books from early days, and the thoughtful reflections on self-discipline and purpose, written on odd scraps of paper, which add an extra dimension to a controlled personality.

Section B, Expeditions and research, is by far the most extensive in the collection and in addition to a full introduction, has frequent explanatory notes. It is presented alphabetically by territory, East Greenland being the first as well as the most important. The organisation and logistics of expeditions, especially the 1935-1936 East Greenland expedition led by Wager, are chronicled in detail, backed by diaries, reports and later correspondence. The field notebooks, catalogues of rock specimens, and the investigative analysis which continued, in collaboration, for almost thirty years are also recorded. Similar material, in somewhat less detail, is found for other areas, notably the plutonic rocks of Rhum and Skye, and for the Himalayan Geology accomplished on the 1933 Everest expedition. The field excursions for students at Reading, Durham and Oxford Universities are also included.

Section C, University of Reading, is relatively short, coinciding as it did with Wager's main period of exploration and later of war service. The material consists of lecture and teaching notes.

Section D, University of Durham, also consists mainly of teaching material, though it also includes Wager's notes and idea in preparation for his first professorial appointment.

Section E, University of Oxford, is concerned almost entirely with the research and teaching of the Department of Geology and Mineralogy. It includes documentation of the Geological Age and Isotope Research Group (GAIR) that Wager established for the study of geochronology and geochemistry and in which a new graduate course in geochemistry was introduced.

Section F, Research topics, is a short section since most of Wager's research notes and data are dispersed through the collection: the petrographic descriptions and analyses are in Section B, while research undertaken for an important paper or lecture may be included in Sections G and H. Section

F includes documentation of a wartime project on biotite and the beginnings of Wager's productive collaboration with R.L. Mitchell on trace elements in the rocks of the Skaergaard Intrusion of East Greenland.

Section G, Lectures, speeches and addresses, covers a wide timespan from talks given as a schoolboy *ca* 1920 to 1964. They include technical lectures given in UK and abroad on all aspects of Wager's scientific interests in layered intrusions, geochemistry and geochronology, and also many less formal talks to non-professional audiences interested in the expeditions to Greenland and Everest.

Section H, Publications, is of interest in showing Wager's methods of work, constantly revising and redrafting, in his notoriously illegible pencil or ink longhand. There are drafts and correspondence relating to *Layered Igneous Rocks*, Wager's major collaborative work with G.M. Brown that he did not live to see published. Where applicable reference has been made to the Bibliography in the Memoir of Wager by W.A. Deer ('Lawrence Rickard Wager', *Biographical Memoirs of Fellows of the Royal Society* **13** 1967), a copy of which is at A.2. However, not all Wager's published works documented in this collection are to be found in this Bibliography and this additional material has been listed in a bibliographical note appended to the introduction of the catalogue.

Section J, Societies and organisations, is scanty but includes material covering Wager's long service on the Royal Society's British National Committee for Geodesy and Geophysics Vulcanology Subcommittee.

Section K, References and recommendations, covers the period 1945-1965 and relates mainly to academic work.

Section L, Correspondence, is not extensive but contains some personal correspondence from family and friends including Cambridge contemporaries and acquaintances. Most of Wager's scientific correspondence remains with the research or other matters to which it refers.

Section M, Non-textual material, is of considerable interest, containing not only photographs and slides of Wager's expeditions but the original drawings and maps made on his early Greenland visits in 1930-1931 and 1935-1936.

The Appendix lists personal and geological diaries 1925-1964, which currently remain in family hands.

There is also an index of correspondents.

WORKS CITED

W.A. Deer, 'Lawrence Rickard Wager', *Biographical Memoirs of Fellows of the Royal Society* **13** (1967).

J. Hargreaves, *L.R. Wager. A Life 1904-1965* (privately printed 1991). A copy is held in the Library, Oxford University Museum of Natural History. References in this catalogue are in the form (*Hargreaves*, p. ...)

E.A. Vincent, *Geology and Mineralogy at Oxford 1860-1986* (privately printed 1994). A copy is held in the Library, Oxford University Museum of Natural History. References in this catalogue are in the form (*Vincent*, p. ...).

BIBLIOGRAPHICAL NOTE

In compiling the catalogue it became evident that a significant number of Wager's publications were not listed in the Bibliography by W.A. Deer in his Memoir of Wager. Attention is drawn in particular to the following items.

B.90	B.301	H.2	H.32
B.143	B.408	H.3	H.60
B.261		H.4	H.66
B.264	F.14	H.5	H.67
B.265	F.30, F.31	H.14	H.81-H.83
B.284		H.15	H.88
B.285	H.1	H.16-H.21	H.97, H.98

LOCATIONS OF FURTHER MATERIAL

Letters, photographs and some personal material, and the diaries listed in the Appendix, remain in family hands.

ACKNOWLEDGEMENTS

We are pleased to acknowledge help from many sources in assembling and processing the material.

Mrs Wager and her family have been very positive in making material available and in offering information. They have all taken an interest in the progress of the work, and in the case of Jane Hargreaves have spent much time identifying drafts and photographs.

At the Oxford University Museum of Natural History Professor W.J. Kennedy, Ms S.M. Brecknell, Miss M.T. Price and Mr R. Hall have all been very helpful.

Special thanks are due to Professor E.A. Vincent, a long-term friend and collaborator of Wager from his time at Reading onward. He has made available his unique fund of knowledge and his phenomenal memory in regular visits throughout the work, and his careful scrutiny of the drafts and index has been of inestimable value.

Jeannine Alton
OXFORD 1999

SECTION A BIOGRAPHICAL AND PERSONAL A.1-A.133

A.1-A.7	OBITUARIES AND TRIBUTES
A.8-A.67	CAREER, HONOURS AND AWARDS
A.68-A.108	DIARIES
A.109-A.133	MISCELLANEOUS BIOGRAPHICAL ITEMS

Biographical and personal

- A.9-A.11 Hebden Bridge School notebooks.
- A.9 'Nature Study 1914-1915'.
- A.10 'Physics 1916-1917'.
- A.11 'Physics 1917-1918'.
- A.12 'School Reports 1914 - 1923'.
- Hebden Bridge United District Secondary School, 1914, 1917-1918, 1919-1920; Oueen's Royal College, Port of Spain, Trinidad, July 1919; Leeds Grammar School 1920, 1922, 1923, also Leeds Grammar School General Paper 1922.
- A.13 Sketches and greetings cards by Wager, 1917 (snow scene), 1920 (West Indies scenes) for Wager's father.
- A.14-A.16 Leeds Grammar School
- A.14 Notes and drawings on rocks and mines in the area of Arncliffe, Littondale, Yorkshire, with a later manuscript note by Wager 'From my very early Arncliffe note book'.
- A.15 Journal entries of 'Xmas holidays 1922-23'.
- A.16 Essays at Leeds Grammar School on scientific, general and descriptive topics. Two only dated 1921, 1923.
- A.17-A.24 University of Cambridge
- A.17 Letter from Pembroke College, 16 October 1922, offering an exhibition of £80 a year, with effect from the academic year 1923.

Biographical and personal

- A.18 Letters from M.E. Wager (father) 1923-1924 and n.d.
- A.19 Letters from H.G. Wager (brother), and from H. Wager (uncle) arranging introductions at Cambridge, 1924.
- Also included here is a card of good wishes and thanks for Wager's assistance with the Duke of York's Camp, 1923.
- A.20 Letters and notes of congratulation on Wager's first-class in Part I of his Natural Sciences Tripos, 1925.
- A.21 Two letters 1925 from S.B. Van Noorden, a Cambridge contemporary and climbing companion who was killed in Snowdonia in 1925 (*Hargreaves* p.24).
- A.22 Letters from J.M. Wordie offering Wager a place on an expedition to East Greenland planned for summer 1926.
- A.23 Pembroke College clubs and societies:
The Martlets [Essay Society], 1926.
Science Society, 1925, 1928.
- A.24 Cambridge University and national clubs and societies:
Climbers Club, 1925.
Cambridge University Mountaineering Club, 1926.
Sedgwick Club, 1926.
Ray Club, 1927.
Alpine Club, 1928.
Miscellaneous Cambridge items.
See also A.126.

Biographical and personal

- A.25 Applications for posts with Colonial Office, Nyasaland, and at the University of Manchester, references and testimonials, 1927.
- A.26 Award of Goldsmith's Company postgraduate studentship 1927-1928, registration as Research Student at Cambridge 1928.
- A.27 Application, correspondence, appointment as Lecturer in Mineralogy and Petrology, University of Reading 1929.
- A.28 Marriage 1934, to Phyllis Margaret Worthington.
Invitation, letter from V.D. Davis who took the service.
- A.29 Correspondence with G.W. Pickering and others, on feverish illness from which Wager suffered March-May 1935. No satisfactory diagnosis was made. (*Hargreaves* p.55).
- A.30 Award of 'a moiety of the Lyell Geological Fund' of the Geological Society of London, 1935.
- A.31 Award of the Mungo Park Medal for 1936, by the Royal Scottish Geographical Society.
- A.32 Election to Council, Royal Geographical Society 1940.
- A.33-A.36 War Service, 1940-1943.
- A.33 Correspondence, notes, arrangements to talk to Friends' Ambulance Unit on warm gear and clothing in Arctic conditions, January 1940.
- A.34 Correspondence, January-August 1940, on war work.

/...

Biographical and personal

- /...
- A possible appointment in naval intelligence did not develop, but in May 1940 Wager was offered a commission in the Photographic Development Unit of R.A.F. Intelligence. His period of service began officially in August 1940.
- Included here is a note of Wager's Sc.D. degree awarded *in absentia* in Cambridge 1941.
- A.35 Certificate of Mention in Despatches 1943.
- Leaving party and memorabilia 1943.
- Official letter of discharge 1944. See also A.39.
- A.36 Miscellaneous letters and items at end of war, possible future of Unit, reunions etc.
- A.37, A.38 Application for the Regius Chair of Geology, University of Edinburgh, 1942-1943.
- A.37 Correspondence with colleagues requesting information and advice about the chair, other candidates, referees, etc. Includes many drafts by Wager and his notes on the situation regarding forthcoming vacancies in university chairs, November 1942 - January 1943.
- A.38 Manuscript and typescript drafts, and final version of Wager's application for the chair, list of publications and testimonials, January 1943.
- A.39-A.43 University of Durham, 1943-1949.
- See also Section D.
- A.39 Correspondence with colleagues and officials, 1943-1944.
- Includes some reference to the Edinburgh chair (see A.37, A.38), Wager's appointment at Durham and the negotiations for his release from the R.A.F. His formal application for release and an appeal by the university were turned down, but a personal intervention by the Vice-Chancellor, Lord Eustace Percy, to the Secretary of State for Air, Sir Archibald Sinclair, was successful in obtaining an initial six months leave of absence.

/...

Biographical and personal

- /... Also included are Wager's own question-and-answer notes for his interview, his resignation from the University of Reading and his resignation of his commission in May 1944.
- A.40 Correspondence and papers on the appointment of a Lecturer in Geology at Durham, 1943.
F.H. Stewart was appointed.
- A.41, A.42 Letters and cards of congratulation to Wager on his appointment at Durham, 1943-1944.
- A.41 A - O.
- A.42 R - W, first-name and unidentified signatures.
- A.43 Miscellaneous shorter correspondence, 1944-1949.
- A.44, A.45 Award of the Bigsby Medal, 1945.
The Bigsby Medal of the Geological Society of London is awarded biennially to geologists under 45.
- A.44 Notification of award, correspondence with the President, Geological Society (W.G. Fearnside), Wager's own résumé of his work, official account and Wager's reply.
- A.45 Letters of congratulation.
- A.46 Offer to Wager to accept appointment to the Yates-Goldsmid Chair of Geology, University College London, 1945.
Letters and discussions with colleagues, November to December 1945, when Wager decided to remain at Durham.

Biographical and personal

- A.47-A.50 Election to Fellowship of the Royal Society, 1946.
- A.47 Formal notification of election March 1946, and arrangements for admission, list of publications (to 1940), brief note of election to the Council of Royal Society 1956.
- A.48-A.50 Letters and cards of congratulation, a few with drafts for reply.
- A.48 A - F.
- A.49 G - P.
- A.50 S - W., first-name and unidentified signatures.
- A.51, A.52 Correspondence and papers relating to the Chair of Geology at the University of Glasgow, June-August 1946.

Wager's draft letters, and his many notes and deliberations, indicate his difficulty in reaching a decision. A brief account is in *Hargreaves* pp. 93-94.
- A.51 Correspondence and drafts.
- A.52 Wager's notes and thoughts about Durham and Glasgow.
- A.53 Award of the Spendiarov Prize, awarded at the 18th International Geological Congress Final Meeting, 1 September 1948.

Letters of congratulation, a few with replies.
- A.54-A.63 Chair of Geology, University of Oxford, 1950.

See also Section E.
- A.54 Correspondence and papers, March-April 1950.

/...

Biographical and personal

- /... Wager had apparently not seen the advertisement for the Oxford Chair and learned of it only on 29 March, two days before the closing date of 31 March. After hurried contact with referees, his application (a copy of which is enclosed) was sent in on 5 April.
- A.55 Correspondence, April-May 1950.

Includes letter of appointment 19 April, arrangements for a first visit to the Oxford Department and to University College where Wager became *ex officio* a Fellow.
- A.56-A.59 Letters of congratulation, a few with replies.
- A.56 A - G.
- A.57 H - M.
- A.58 N - R.
- A.59 S - W, and unidentified.
- A.60 Correspondence and papers, with colleagues and staff at Oxford; arrangements for visits, information on departmental staff, apparatus and facilities, financial estimates, May - July 1950.
- A.61 Miscellaneous notes by Wager on the Oxford Department.
- A.62 Miscellaneous shorter correspondence on apparatus and furniture for the Department.
- A.63 'Progress of Geology'. Miscellaneous notes, drafts, references, perhaps for lecture or lectures on the history of geology at Oxford, the teaching of geology and its relations to other sciences, geochemistry etc. n.d. but probably related to the Oxford Chair.

Biographical and personal

- A.64 Correspondence relating to Wager's sabbatical leave in 1959, spent mainly in Switzerland. Includes correspondence with colleagues continuing to 1961.
- A.65 Award of the Lyell Medal of Geological Society of London, 1962.
One letter only.
- A.66 Election as foreign member, Royal Danish Academy of Sciences and Letters, 1963.
- A.67 Correspondence and papers on the award of the Wager Prize for Volcanological Research, to commemorate Wager's work, 1973-1983.
- A.68-A.108 DIARIES 1914-1965**
- A.68 1914. Also includes two pages torn from diary for January 1916.
- A.69 Memorandum book (hardly used) 1915.
- A.70 1924.
- A.71-A.77 Cambridge University pocket diaries, 1922-1930.
- A.71 1922-1923.
- A.72 1924-1925.
- A.73 1925-1926.
- A.74 1926-1927.

Biographical and personal

A.75	1927-1928.
A.76	1928-1929.
A.77	1929-1930.
A.78-A.85	University of Reading Students' Union diaries, 1931-1940.
A.78	1931-1932.
A.79	1932-1933.
A.80	1933-1934.
A.81	1934-1935.
A.82	1936-1937.
A.83	1937-1938.
A.84	1938-1939.
A.85	1939-1940.
A.86	R.A.F. diary 1942.
A.87-A.91	Small Boots' Co. pocket diaries, 1945-1949.
A.87	1945.

Biographical and personal

A.88	1946.
A.89	1947.
A.90	1948.
A.91	1949.
A.92	Letts diary 1949.
A.93	University of Durham diary, 1949-1950.
A.94-A.108	Oxford University pocket diaries, 1950-1966.
A.94	1950-1951.
A.95	1951-1952.
A.96	1952-1953.
A.97	1953-1954.
A.98	1954-1955.
A.99	1955-1956.
A.100	1956-1957.

Biographical and personal

A.101 1957-1958.

A.102 1958-1959.

A.103 1959-1960.

A.104 1960-1961.

A.105 1961-1962.

A.106 1962-1963.

A.107 1964-1965.

A.108 1965-1966.

A.109-A.133

MISCELLANEOUS BIOGRAPHICAL ITEMS

1921-1963

A.109-A.115 Passports and personal documentation

A.116-A.118 Address books

A.119-A.123 Accounts

A.124-A.128 Clubs and societies

A.129-A.133 Thoughts and reflections

Biographical and personal

A.109-A.115	Passports and personal documentation	1932-1962
A.109-A.112	Passports, 1932-1962.	
A.109	1932.	
A.110	1942.	
A.111	1961.	
A.112	1962.	
A.113, A.114	Driving Licences.	
A.115	Club Alpin Français.	
A.116-A.118	Address books	
A.116	Thumb-index unbound address list, perhaps from Cambridge period, n.d.	
A.117	Address book, Reading period.	
A.118	Address book for despatch of reprints, Oxford period.	
A.119-A.123	Accounts	1921-1960
A.119	Small account book, Hebden Bridge Secondary School. Some dates, 1921, 1922.	
A.120	Small account book, Pembroke College Cambridge.	

Biographical and personal

- A.121 Small bank account book, 1935-1940.
- A.122 Small bank account book, 1930-1960.
- A.123 Miscellaneous bills and accounts of personal interest. Various dates 1923-1934.
- A.124-A.128 Clubs and societies ca 1924-1963**
- A.124, A.125 Arctic Club
- A.124 Annual Dinner menus, almost all with signatures of members and guests, some with seating plans. Various dates 1932-1963.
- A.125 Correspondence about membership, guests, attendance, arrangements for Arctic Club Dinners, especially 1952 when the Dinner was held in Brasenose College Oxford and Wager was President. 1952-1964
- A.126 Cambridge University Mountaineering Club. Lists of Officers, members, meetings cards. Not all dated, ca 1924-1940.
- A.127 Miscellaneous commemorative dinner menus, many signed and with seating plans. Various dates 1933-1961.
- A.128 Miscellaneous items relating to folk and Morris dancing. Various dates 1928-1934.
- A.129-A.133 Thoughts and reflections**
- A.129 Hard-backed exercise book. Used for drafts and thoughts on the philosophy of science, influence of science on modern thought, scientific method, metaphysics etc. n.d. but references are made to work published in 1921.

Biographical and personal

- A.130 Small pocket notebook. Used for quotations, reflections and ideas on science, art and philosophy. Includes accounts of discussions with Cambridge contemporaries, and of lectures attended 1926.
- A.131 Miscellaneous short notes on philosophy of science.
- A.132 Personal reflections, self-guidance, prayer, many on small pieces of paper and undated.

They include Wager's reflections on the effect of his mother's death in 1916 when he was twelve, his thoughts on mountaineering with E.E. Shipton, religious ideas and a 'Child's Prayer' for his family 1945.
- A.133 Poems.

Brief accounts of mountaineering.

SECTION B

EXPEDITIONS AND RESEARCH

B.1-B.478

This is by far the most extensive section in the collection and within it East Greenland occupies the major part.

Wager's first Arctic expedition, begun only a few months after his 1929 appointment at the University of Reading, was as a member of the British Arctic Air Route Expedition (BAARE), led by H.G. ('Gino') Watkins, in 1930-1931 (B.1-B.21). The purpose of the expedition was to reconnoitre a possible air route across the Greenland Ice Cap, requiring mapping, surveying and meteorological observations. For Wager, it was in addition the occasion of his discovery of the 'Skaergaard Intrusion', which he first observed from the deck of the *Quest* on the voyage from base camp at Angmagssalik to Kangerdlugssuaq. He immediately recognised its geological importance as a classic example of a layered intrusion, and, beginning during the expedition itself, as can be seen from his diaries and future planning notes, he made its exploration and study the primary aim of his future research career.

Further expeditions to East Greenland followed, in 1932, 1934, 1935-1936 and 1953; another had been planned for 1966-1967 in which Wager himself did not live to participate.

Analysis of the East Greenland rocks began in 1933. Laboratory research into age, structure and tectonics, and geochemistry, drawing on increasingly sophisticated methods, was pursued by Wager and his assistants throughout his life, accompanied by a stream of publications and lectures. His interest in British Tertiary Igneous rocks, particularly the layered intrusions of Rhum and Skye, is documented in frequent expeditions to Scotland, and subsequent research (B.347-B.391). Additional shorter expeditions to South Africa (B.392-B.404) and the West Indies in 1959 (B.405-B.415) provided further material. Wager's major book *Layered Igneous Rocks*, written in collaboration with G.M. (Sir Malcolm) Brown, appeared posthumously in 1967.

Wager's participation in the 1933 expedition to Mount Everest, and in the final (unsuccessful) assault on the summit (B.253-B.307) made him a national figure, yet was in some sense a distraction from his layered intrusion research. He put the expedition to maximum geological use, however, by acquiring specimens and by studying in particular the mechanism of the rise of the Himalayan range and the river drainage systems.

The surviving material for all these expeditions may include: preliminary planning, organisation, funding, personnel, equipment and transport; diaries, field notebooks and rock catalogues; research notes and notebooks; reports; publications and lectures; correspondence both preceding and following the expedition. The proportions and extent of the material varies. Expeditions of which

Expeditions and research

Wager was the leader or joint leader, notably those of 1935-1936 and 1953, carry an exceptionally full and interesting record of all aspects of the careful organisation involved. Shorter expeditions, or those where he was not leading or bearing primary responsibility, are proportionately less extensive.

Wager's acknowledged experience in the Arctic and elsewhere led to his being regularly consulted on proposed expeditions by others. Material of this kind is retained at B.456-B.474.

Maps, photographs and other non-textual material are in Section M.

Wager's personal diaries written on expeditions are listed in the Appendix. They currently remain in family hands.

The material is presented as follows:

B.1-B.252	EAST GREENLAND
B.253-B.307	EVEREST 1933
B.308-B.346	IRELAND
B.347-B.391	SCOTLAND
B.392-B.404	SOUTH AFRICA
B.405-B.415	WEST INDIES
B.416-B.441	YORKSHIRE
B.442-B.455	MISCELLANEOUS EXCURSIONS
B.456-B.474	ADVICE AND CORRESPONDENCE
B.475-B.478	MISCELLANEOUS ROCK CATALOGUES

Expeditions and research

B.1-B.252	EAST GREENLAND	1930-1965
B.1-B.21	BRITISH ARCTIC AIR ROUTE EXPEDITION (BAARE) 1930-1931	
B.22-B.36	SCORESBY SOUND COMMITTEE'S SECOND EAST GREENLAND EXPEDITION 1932	
B.37	CHARCOT <i>POURQUOI PAS?</i> EXPEDITION 1934	
B.38-B.120	BRITISH EAST GREENLAND EXPEDITION (BEGE) 1935-1936	
B.121-B.146	EAST GREENLAND GEOLOGICAL EXPEDITION (EGGE) 1953	
B.147	BRITISH EAST GREENLAND GEOLOGICAL EXPEDITION 1966-1967	
B.148-B.181	EAST GREENLAND ROCK CATALOGUES	
B.182-B.252	EAST GREENLAND RESEARCH	

B.1-B.21	BRITISH ARCTIC AIR ROUTE EXPEDITION (BAARE) 1930-1931	1930-1955
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In January 1930 Wager was actively considering joining an expedition to Spitsbergen with Meredith Jackson (see B.1). Later that month, however, he received an invitation from H.G. ('Gino') Watkins to join his British Arctic Air Route Expedition as geologist (B.2). Wager consented immediately, sailing with the party in July 1930 on the *Quest*. He contributed to the team's work in mapping and surveying, and also as a climber leading an attempt to climb Mont Forel, the highest peak then known in the Arctic. His own career received its definitive direction though the discovery and pioneer survey of the plutonic centres of the Skaergaard Intrusion and surrounding area of the East Greenland coast. Most of his subsequent expeditions to Greenland and elsewhere, and the resulting research and publications, derive from this discovery.

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Expeditions and research

/... Of some interest is a short sequence of correspondence from Watkins about a proposed expedition to the Antarctic that he hoped Wager would join (B.4). In the event, Watkins drowned during an Arctic expedition in the summer of 1932; a reference to his Antarctic proposal is quoted by *Hargreaves* p.38.

A register of meteorological observations kept by Wager during the expedition is at Appendix App. 9.

B.1-B.10	Organisation and arrangements
B.11-B.13	Later correspondence
B.14-B.19	Letters and diaries
B.20, B.21	Press cuttings

B.1-B.10 Organisation and arrangements 1930-1933, 1955

B.1 Correspondence on proposed journey to Spitsbergen with Meredith Jackson. Advice, information etc., January - February 1930.

The first letter is dated 13 January, thus antedating the correspondence from Watkins. A letter from Jackson of 3 February begins 'Please don't feel that you're backing out of anything'.

B.2 Correspondence with Watkins, 1930-1931.

These letters (incoming only) are all manuscript and not fully dated; the year is rarely given and the month is abbreviated sometimes to an initial letter.

Watkins's first letter dated 19 January invites Wager to join the expedition 'for the purpose of investigating the possibilities of an air route between Canada and England via Faroe Islands, Iceland, Greenland, Baffin Land, Hudson Bay and Winnipeg'. Wager seems to have replied favourably at once (letter of 20 January) and given a firm commitment by 5 February. The correspondence continues with detailed arrangements and includes radio messages, February 1931, on pick-up by aeroplane.

B.3 Draft agreement.

The aims are here given as 'to explore in Greenland and elsewhere Arctic Air Routes'.

B.4 Letters from Watkins on proposed Antarctic expedition, 'Dec. 21st [1931]', 'Jan. 3rd', 'J. 27th' [1932].

Expeditions and research

- B.5 Leave of absence from the University of Reading, July 1930 - August 1931.
Wager's manuscript letter of application for leave details the aims of the expedition with special reference to geology.
- B.6 Correspondence with University of Cambridge *re* award of grant from the Worts Fund, and deferral of Wager's dissertation until after the expedition.
- B.7 Correspondence with Royal Society *re* grants made to Wager for 'an investigation of the reconnaissance geology of East Greenland' (1930) and 'the study of petrological results of British Arctic Air Route Expedition to Greenland' (1931), 1930-1933.
- B.8 Miscellaneous correspondence 1930-1931.
Information, messages of good luck etc.
- B.9 Lists compiled by Wager.
Includes 'List to be taken by first in ice cap expedition Aug. 9 1930', list for 'Coast Journey (Motor Boat)', list of 68 photographs taken during expedition, notes for lectures (kept with above, no indication when given).
- B.10 Miscellaneous items.
Includes copy of Wager's certificate of medical fitness; notes on methods of rock collection; Christmas 1930 dinner menu (signed by team members); humorous poem 'Living on the country' by J.M. Scott, 1931.
Also included here is a menu of the 'The Quest Dinner' commemorating 25th anniversary of the sailing, held 6 July 1955. See also L.15.
- B.11-B.13 Later correspondence 1931-1949**
- B.11 Award of the Polar Medal 1932.
- B.12 Correspondence from colleagues 1931-1934.
Includes letter from A. Courtauld on proposed memorial for Watkins, dated 9 October, no year, probably 1932.

Expeditions and research

B.21 Miscellaneous press cuttings mainly relating to the rescue of A. Courtauld after six weeks alone at the ice cap station.

**B.22-B.36 SCORESBY SOUND COMMITTEE'S SECOND EAST 1932-1934
GREENLAND EXPEDITION 1932**

This was a Danish expedition organised by the Scoresby Sound Committee. The leader was Ejnar Mikkelsen, who became a close friend of Wager and his family, the expedition being commonly referred to as the 'Mikki Expedition'. The expedition sailed from Copenhagen on 22 June 1932, returning in September. Wager was responsible for the geological work, at Kangerdlugssuaq and Kap Dalton, and the party also included his brother H.G. (Hal) Wager and another friend, Michael Spender, as cartographer. Immediately on his return, Wager began to plan a more extended expedition including over-wintering, to enable detailed surveying of the region to be achieved (see B.25). His nomination to the 1933 Everest team deferred the plan until the major British East Greenland Expedition of 1935-1936 (B.38-B.120).

B.22-B.24 Organisation and arrangements

B.25-B.29 Later correspondence

B.30 Diary

B.31-B.33 Reports

B.34-B.36 Research

B.22-B.24 Organisation and arrangements 1932-1933

B.22 Letters from H.G. Wager on his participation in the expedition, February-May 1932.

B.23 Correspondence with Mikkelsen, April 1932 - January 1933.

Invitation, detailed arrangements, conditions of work (letter of 7 June 1932), payment of accounts. Mikkelsen's later letters refer to the Danish-Norwegian dispute over Greenland, the Everest expedition and Wager's proposed future work in Greenland.

A letter from M. Spender, May 1932, about the expedition is included here.

B.24 Miscellaneous items: list of members, messages of goodwill, accounts.

Expeditions and research

- | B.25-B.29 | Later correspondence | 1932-1934, n.d. |
|------------------|---|------------------------|
| B.25 | Correspondence with J.M. Wordie, with Wager's outline of his plans for an extended expedition to Scoresby Sound, October 1932. | |
| B.26 | Correspondence with M. Spender on various expedition plans, October 1932 - September 1933; Spender took part in the Danish 7th Thule Expedition. Includes a proposal by Spender for a journey to Kangerlugssuaq in spring 1935.

Also included here is an 8pp typescript draft on 'Hvitserkr', a high mountain on the Greenland coast, and its location. No author, date or place of publication are given, but reference is made to an article of 1935 and the work of M. Spender. | |
| B.27 | Correspondence and draft letters on Wager's appointment to the Everest team and its effect on East Greenland work, especially for his Danish colleagues, January 1933. | |
| B.28 | Miscellaneous scientific correspondence, 1932-1933. | |
| B.29 | Correspondence with Mikkelsen, September 1933 - May 1934.

General news of research and expeditions by Koch, Rasmussen, Charcot, lectures and papers, arrangements for publication of Wager's maps and papers. | |
| B.30 | Diary | 1932 |
| B.30 | Typescript diary entry, 20 August 1932 only. | |
| B.31-B.33 | Reports | 1932-1933 |
| B.31 | Wager's manuscript account of 'The Metamorphic Complex' between Kap Dalton and Kangerdlugssuaq, prepared at the request of V. Stefansson of Pan American Airways.

Includes a letter from Mikkelsen, who writes: 'I don't think that aircrafts [sic] ever will make a success of Kangerdlugssuak...he [Stefansson] has got the Trans-Greenland flying on his brain - I don't believe in it'. | |

Expeditions and research

- B.32 Printed note on 'Explorations in East Greenland South of Scoresby Sound', *Geog. Review*, July 1933.
- B.33 Miscellaneous correspondence on Wager's publications on Greenland, 1933.
- B.34-B.36 Research 1932-1934**
- B.34 Wager's manuscript geological and research notes. Various dates August 1932, July 1934.
- B.35 Analyses of Greenland rocks, undertaken for Wager by H.F. Harwood at Imperial College London, 1933.
- B.36 Letters from A. Holmes and F.W. Bannister on analyses of Greenland rocks, 1934.
- B.37 CHARCOT *POURQUOI PAS?* EXPEDITION 1934 1934**
- B.37 Correspondence from J.-B. Charcot on his proposed expedition on his ship the *Pourquoi Pas?* to Scoresby Sound for approximately two months, 1934-1935.
- Wager accompanied the expedition but returned earlier than the main party,
- Also enclosed is a telegram: 'All well good luck love Phyl' from Wager's fiancée Phyllis Worthington whom he married in October 1934.
- B.38-B.120 BRITISH EAST GREENLAND EXPEDITION 1933-1963
(BEGE) 1935-1936**
- This was the culmination of Wager's long-matured plan for extended over-wintering expedition, which would enable scientific projects to be carried out in appropriate detail. A significant modification was the presence of women in the party, notably Phyl Wager, his newly married wife, and Kit, wife of H.G. Wager, the first British women to over-winter in Greenland.

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Expeditions and research

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The expedition sailed on the *Quest* in July 1935. Its 'summer party' of mountaineers and climbers, which included A. Courtauld and J.L. Longland, made a successful ascent of the highest peak of the Watkins mountains. The over-wintering party of seven Europeans and fourteen Greenlanders remained after the *Quest* sailed home in August.

Wager's responsibility as leader and organiser, his determination to make maximum use of the opportunity for sustained scientific research, and the practical help given by his wife, have ensured an unusually full record of every aspect of the expedition. A further account of the planning, and of the daily life of the expedition can be found in *Hargreaves*, pp 53-56 and Chapter 9.

The surveying, meteorological and geological work achieved formed the basis of Wager's continuing research and publications, in collaboration with W.A. Deer and many others in his University Departments.

B.38-B.82	Organisation and arrangements
B.83-B.89	Diaries and notes during expedition
B.90-B.109	Reports, publications and lectures
B.110-B.120	Later correspondence and research

B.38-B.82	Organisation and arrangements	1933-1939
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B.38-B.47	Planning and permission
B.48-B.55	Funding
B.56-B.62	Personnel
B.63-B.66	Food, equipment and supplies
B.67-B.70	Shipping and transport
B.71-B.76	Miscellaneous correspondence and arrangements
B.77-B.82	Stores and accounts

B.38-B.47	Planning and permission
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B.38 Manuscript and typescript plans, heavily revised, for an East Greenland expedition, originally planned for 1934-1935, later amended to 1935-1936. Final version adds in a headnote: 'During the first summer the members of this expedition will combine with Mr. Augustine Courtauld's party in an attempt on the New Mountains'.

Expeditions and research

- B.39 Correspondence *re* leave of absence from the University of Reading, 1934-1935.
- B.40-B.45 Correspondence with colleagues on scientific work to be undertaken, choice of personnel, funding etc.
- B.40 Meteorology, 1934-1937.
- B.41 Correspondence with C.S. Elton on zoology and entomology, 1935.
- B.42 Correspondence with J.S. Gardiner on funding, personnel, zoology, 1934-1935.
- B.43 Correspondence with A.C. Seward on funding, botanical specimens, fossil wood, 1934-1936.
- B.44 Correspondence with J.M. Wordie on Visting Sledges and other equipment, 1935.
- B.45 Miscellaneous correspondence on funding and on botanical specimens, 1935.
- B.46 Correspondence with Foreign Office for official permission for expedition, 1934-1935.
- B.47 Correspondence with the Danish Administration of Greenland, comments on Wager's plan, negotiations, Wager's visit to Copenhagen, revised plans, payment of deposit, arrangements for Greenlanders, final statement of account and return of surplus funds, 1935-1936.
- B.48-B.55 **Funding**
- B.48 Miss S.R. Courtauld (private contribution), 1935.

Expeditions and research

- B.49 Gino Watkins Memorial Fund, 1935.
- B.50 Percy Sladen Memorial Fund, 1935.
- B.51 The University of Reading, 1935-1939.
Includes grants for the expedition and for subsequent research work, rock sectioning and equipment.
- B.52 Royal Geographical Society, 1933-1935.
Includes application made in 1933 for the proposed expedition 1934-1935, later postponed to 1935-1936; also loan of instruments and Wager's estimate of income and expenditure for the expedition.
- B.53 Royal Society, 1934-1938.
Includes correspondence with referees and colleagues and with the Society, also loan of cameras, and Wager's summary report on the expedition.
- B.54 Leverhulme Foundation, 1935-1937.
Correspondence and papers from referees and colleagues, and with the Foundation, on the award to Wager of a Research Fellowship towards the cost of the expedition. The Fellowship was extended for a further year, 1936-1937, to continue the research, but Wager was unable to obtain a further year's leave of absence from the University of Reading and had to decline. Also includes Wager's short report on the expedition.
- B.55 Unsuccessful applications: Gloyne Fund, Worts Fund.
- B.56-B.62 **Personnel**
Correspondence with team members; invitation, equipment, arrangements.
- B.56 P.B. Chambers, 'handyman', 1935. See *Hargreaves* p.54.

Expeditions and research

- B.57 A. Courtauld, 1933-1935 (few letters dated).

Courtauld made possible the summer climbing expedition, in which he took part. He returned in the *Quest* in August 1935 and acted as representative of the expedition in England while its members were out of contact with Europe (see Wager's letter 28 August 1935).
- B.58 W.A. Deer, geologist, 1935.
- B.59 E.C. Fountaine, medical officer and surveyor, 1935.
- B.60 J.L. Longland, mountaineer, 1935.

Longland had been a member of the 1933 Everest expedition and much of his correspondence relates to the affairs of the Everest Committee.
- B.61 H.G. Wager, botanist, 1935 (not all dated).
- B.62 Applicants not selected, or unable to join expeditions, 1933-1935.
- B.63-B.66 **Food, equipment and supplies**
- B.63 Letters to food manufacturers and firms requesting help with provisions

1 box.
- B.64 Letters to firms and manufacturers of clothing, equipment and supplies requesting help.

1 box.
- B.65 Draft letters to suppliers of food and equipment 'tailored' to specific firms and requirements as well as including general information on the scope of the expedition. Also included is a tabulated résumé of firms approached and type of appeal. Almost all in the hand of Mrs Wager.

Expeditions and research

- B.66 Draft letters and tabulated information written after the expedition thanking suppliers for their products. Almost all in the hand of Mrs Wager.
- B.67-B.70 **Shipping and transport**
- B.67 Daily returns of goods received and stored at Aberdeen awaiting departure, May - June 1935.
- B.68 Purchase of two hunting boats, 1935.
- B.69 Arrangements for shipping and customs clearance into UK for Greenland specimens at end of expedition, 1936.
- B.70 Correspondence and contract *re* chartering of SS *Saelis* to pick up expedition members in August 1936. 1935-1937.
- B.71-B.76 **Miscellaneous correspondence and arrangements**
- B.71 Correspondence with E. Mikkelsen, February - July 1935 on all aspects of the expedition but with special reference to the construction of the three-roomed wooden house shipped out as living and working quarters.
- B.72 Plans, photographs, instructions for erecting the house.
- B.73 Lists of clothing and equipment required by team members, and specific lists for reconnaissance and longer-stay journeys during expedition. List of geological equipment (in Deer's hand).
- B.74 Correspondence with Geodetic Institute of Denmark on loan of photographs and maps. Correspondence continues to 1937 with reference to new names proposed for features of Kangerdlugssuak and Knud Rasmussen Land as a result of the expedition. See also M.102.
- B.75 Miscellaneous shorter correspondence, 1934-1935.

Expeditions and research

- B.76 Good luck messages.
- Radio messages sent to Wager from ship. Included here is a copy of Wager's letter 29 August 1935 to Sir Percy Cox explaining progress to date, arrangements for departure in 1936 and his intention, should weather conditions for return be unfavourable, to 'settle down for another year of work...we have plenty of food and ammunition to make this satisfactory for both the Eskimos and ourselves'.
- B.77-B.82 **Stores and accounts**
- B.77 List of Food and Equipment.
- 'Stores in Bachelor's House'.
- 'Stores on Bum's House'. This was the expedition nickname for the Greenlanders. Its origin is explained in *Hargreaves* p.63.
- B.78 Analysis of food values and diet requirements. Includes letter from J.C. Drummond.
- B.79 Small red notebook 'Stores List'.
- B.80 Thumb-indexed lists of stores and suppliers.
- B.81 Wager's bank account book for the expedition.
- B.82 Ledger of BEGE accounts.
- B.83-B.89 Diaries and notes during expedition 1935-1936**
- B.83 Tabulated lists of seals, bears and narwhals shot.
- B.84 Working notes of work to be done, sledge journeys undertaken, calculations of food and equipment required. Includes diary and notes by W.A. Deer on one of the summer journeys.

Expeditions and research

- B.85 Manuscript notes 'The Dyke Swarms', 9 November 1935.
- B.86 Manuscript notes 'General notes on the lavas', May 1936.
- M.87 Manuscript notes 'Skaergaard Intrusion. Notes done in Greenland 1935-6'. Some of the last analyses may have been done later.
- B.88 Typescript copy of diary. Entries run 18 January - 12 August 1936, but are not complete.
- B.89 'Extract from diary 1936'.
Few pages only, describing journey with Hansi, a Greenlander, 20-31 May. Several deletions and amendments.
- B.90-B.109 Reports, publications and lectures 1935-1947**
- Brief reports on the expedition, written for funding bodies, are at B.53 and B.54. Other lectures and publication material is in Sections G and H.
- B.90 Brief statement of plans for the expedition 1935, and summary of its work 1936, both for *Polar Record* (not in Bibliography).
- B.91 Correspondence on possible articles for *The Daily Telegraph*, 1935.
Six articles are mentioned. The plan does not seem to have been successful and the articles were written for *The Times*.
- B.92-B.99 Correspondence and drafts for articles in *The Times*, 1935-1936.
- B.92 Arrangements and accompanying correspondence, 1935-1937. The articles, none of which is listed in the Bibliography, were each to be written by a different member of the expedition.

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Expeditions and research

- /... Included here are press cuttings of three published articles:
- I A Peak in the Arctic, by J.L. Longland. See B.102.
 - II The Summit of the Arctic, by Wager. See B.94.
 - III Descent from the Mountains, by A. Courtauld.
- B.93 'The Watkins Mountains'.
- B.94 'The Watkins Mountains. Ascent of the highest peak in the Arctic. The second half of the sledging journey and the climb'.
- B.95 'Exploration in Greenland'. Brief account only.
- B.96 'Exploration in Greenland I. Over-wintering among the highest mountains of the Arctic' (by Mrs Wager).
- B.97 'Exploration in Greenland. Fifteen months among the highest mountains of the Arctic'.
- B.98 'Exploration in Greenland III. The mountain zone between ice cap and polar pack'.
- B.99 Untitled and incomplete draft.
- B.100, B.101 'The Kangerdlugssuaq region of East Greenland' (*Geol. J.* **90**, 1937).
This was first given as a lecture at the Geological Society and attracted great interest at the time, and later in its published form.
- B.100 Proof for published text, including other contributions and discussion at the meeting.
- B.101 Correspondence preceding and arising from lecture, 1937-1938.

Expeditions and research

- B.102-B.104 Papers and reports by others.
- See H.22-H.24, H.25 for later papers in the 'Geological investigations in East Greenland' series, by Wager's students, published by *Meddelelser om Grønland*.
- B.102 Heavily corrected manuscript account of summer climbing expedition by 'J.L.L.' (Longland) with a note 'Rough draft of Times article' (included at B.92).
- B.103 'Report on certain medical research on Eskimos by the British East Greenland Expedition'. Unsigned, but by E.C. Fountaine.
- B.104 'Meteorological observations of the British East Greenland Expedition 1935-36 at Kangerdlugssuaq', paper by E. Gordon Manley. Latest reference 1936. Folder includes correspondence from Manley, 1935-1936.
- B.105 Correspondence with editors of *Meddelelser om Grønland*, on the publication of Wager's and Deer's major papers on 'Geological investigations in East Greenland', and other publications, 1936-1951.
- B.106-B.109 Letters of thanks, comment etc. from colleagues on receipt of copies of Wager's and Deer's papers 'Geological Investigations in East Greenland' in *Medd. om. Grøn.*
- B.106 1934 Part I.
- B.107 1936 Part II (published 1935).
- B.108 1939 Part III. This was a major publication, occupying the whole of vol.105 of the journal; it was reissued in 1962. Some of the letters refer to wartime conditions and their effect on research.
- B.109 1947 Part IV. Wager was sole author of this paper.

Expeditions and research

B.110-B.120	Later correspondence and research	1936-1963
	Almost all the correspondence deals with post-expedition research.	
B.110	Letters of welcome on safe return from expedition, including Wager's letters of thanks to his scientific patrons and their replies, 1936.	
B.111	Correspondence on entomological specimens brought back from Greenland, 1936-1937.	
B.112	Correspondence 1936, 1937.	
B.113	Correspondence and information from colleagues on analysis of East Greenland rocks, 1937.	
B.114	Correspondence 1938, 1939.	
B.115	Correspondence with C.E. Tilley on rock analysis, publication, possible expedition to southwest Greenland, 1938-1940.	
B.116	Correspondence on East Greenland plants, 1940. Correspondence on belemnites, 1940-1944.	
B.117	Correspondence and analyses with I.D. Muir, on Skaergaard plagioclases, 1949-1955.	
B.118-B.120	Work on Skaergaard olivines.	
B.118	Correspondence and analyses, 1951-1953.	
B.119	Correspondence, 1960.	

Expeditions and research

B.120 Correspondence, data and draft for paper by E.A. Vincent, J.A.V. Douglas and M.G. Bown published in *Amer. Mineral*, 1964.

**B.121-B.146 EAST GREENLAND GEOLOGICAL EXPEDITION 1938-1953
(EGGE) 1953**

The EGGE was a relatively short expedition of six weeks July - September 1953, organised as a joint venture of Oxford and Manchester Universities under the leadership of Wager and W.A. Deer. The Oxford members were G.M. Brown, D.S. Weedon and C.J. Hughes; the Manchester members were G.D. Nicholls and P.E. Brown. Wager's party of four worked on the Kangerdlussuaq alkaline complex, while Deer and his party concentrated on the Kap Edvard Holm intrusion.

A return to East Greenland had, however, been in Wager's mind virtually ever since his return from the major expedition of 1935-1936. He had hoped to organise a visit to South West Greenland (see B.121, B.122 and also correspondence with C.E. Tilley at B.115) but various factors supervened to delay or frustrate the proposal: the outbreak of the Second World War and the decision of the Danish authorities to undertake mapping and geological research in the area themselves; Wager's own interest in the British Tertiary Igneous Province, and other delays in finalising the expedition. The 'Early plans' at B.121-B.123 help to explain this long gestation.

When plans began to get under way, W.A. Deer acted as secretary to the expedition; nevertheless it is clear that Wager took many of the initiatives and kept the organisation under his eye. The arrangements and organisation follow the same plan as those for BEGE but in less detail.

B.121-B.123	Earlier expedition plans
B.124-B.141	Organisation and arrangements
B.142	Diary
B.143, B.144	Reports and publications
B.145, B.146	Later correspondence

B.121-B.123 Earlier expedition plans 1938-1947

B.121 Correspondence on proposed work in South Greenland in summer 1939 and summer 1940.

Expeditions and research

- B.122 Correspondence 1945-1946 with Danish and UK colleagues and friends.
- This includes both personal and scientific material taking up threads after the war, exchange of specimens, publications etc. Includes Wager's and Deer's 'Proposals for a Petrological and Mineralogical re-investigation of the Ilimausak and Related Intrusions of South West Greenland' which did not eventuate.
- B.123 Correspondence with A. Courtauld on plans for East Greenland, 1947.
- B.124-B.141 Organisation and arrangements 1948-1954**
- B.124-B.130 Planning and permission
- B.131, B.132 Funding
- B.133 Personnel
- B.134-B.139 Food, equipment and supplies
- B.140, B.141 Shipping
- B.124-B.130 **Planning and permission**
- B.124 Correspondence with W.A. Deer and Danish colleagues on proposed expedition to East Greenland in 1951, funding, transport, other expeditions. 1948-1950.
- B.125 Correspondence 1951, mainly with W.A. Deer, whose broken leg, obliged them to cancel the proposed expedition and defer it to 1953. Correspondence also includes discussion of I.D. Muir's work on pyroxenes (see B.117) and the acquisition of a Franz isodynamic separator for the Oxford Department.
- B.126 Correspondence May-December 1952, funding, organisation, 'Statement of present position'.
- B.127 Correspondence on all aspects of organisation, proposal for official permission and funding applications, supplies, equipment etc., January-July 1953.

Expeditions and research

- B.128 Correspondence and advice from colleagues on topics and methods of research, 1953.
- B.129 'Preliminary Statement. An expedition for the further geological investigations of the Kangerdlugssuaq and Knud Rasmussen Land regions of East Greenland'.

Two versions (not identical) for an expedition in summer 1951, to include an over-wintering party of three or four geologists. Referred to in correspondence in B.124.
- B.130 Revised plan, submitted to Foreign Office in February 1953, permission being granted by the Danish Government in May.
- B.131, B.132 **Funding**
- B.131 Percy Sladen Fund (Linnean Society) 1953-1955.

Application, statement, estimated budget, Wager's brief report on the work done, correspondence on final accounts, disposal of equipment etc.
- B.132 Royal Society, 1953-1955.

Correspondence, application and estimates, brief report on the work done, statements of account.
- B.133 **Personnel**

Brief correspondence, 1952.
- B.134-B.139 **Food, equipment and supplies**
- B.134 Carbon copies of W.A. Deer's letters to manufacturers, Board of Trade, Ministry of Food, on supplies, export licences, 1953.

Expeditions and research

- B.135 Wager's correspondence with suppliers, manufacturers and colleagues on items required for expedition. Kept by Wager in numbered bundles:
2. Air photos and maps (and return after expedition).
 3. Hammers.
 4. Tents.
 5. Photographic and film.
 6. Surveying equipment.
 7. Helmets, life jackets.
 8. Rifles and ammunition.
- B.136 Correspondence on 'Penta' outboard motor taken on 1953 expedition. This was the one used on BEGE 1935-1936, the original correspondence being included here.
- This may have been number 1 in the sequence in B.135.
- B.137 Lists of camping, geological, miscellaneous and personal equipment, lists of rations, contents of boxes etc.
- B.138 Lists of books and papers, note on first aid; medical certificates; travelling schedules, including changes to return journey plans.
- B.139 Customs clearance for rock specimens, return of goods etc. after expedition.
- B.140, B.141 **Shipping**
- B.140 Negotiations with Royal Greenland Trade Department on outward and return shipping for expedition, 1952-1953.
- B.141 Shorter correspondence on sharing transport, 1952.
- B.142 **Diary** **1953**
- B.142 Typescript transcript of Wager's diary, 12-31 August 1953.

Expeditions and research

B.143, B.144 Reports and publications 1954

See also brief reports sent to funding bodies at B.131, B.132.

B.143 Correspondence and draft article for *Polar Record* 1954 (not listed in Bibliography).

B.144 Shorter requests to write articles or books.

B.145, B.146 Later correspondence 1953-1954

B.145 Shorter correspondence on accounts and expenses, 1953-1954.

B.146 Shorter scientific correspondence on East Greenland material, 1953, 1954.

**B.147 BRITISH EAST GREENLAND GEOLOGICAL
EXPEDITION 1966-1967 1965**

Like the 1953 expedition, this was to be jointly led by Wager and W.A. Deer. Plans and discussions took place throughout 1965, including an application for funding by the Department of Scientific and Industrial Research (DSIR). Following Wager's sudden death in November 1965, the expedition went ahead under Deer's leadership.

B.147 Statement of objectives, costings etc, photocopy of DSIR application, revised plans for 1966 with Deer as leader and P.E. Brown as deputy leader.

B.148-B.181 EAST GREENLAND ROCK CATALOGUES 1930-1965

Wager's original notebooks are small black pocketbooks numbered on the spine in Roman numerals I-XV and an extra number XA, with a front cover label bearing the numbers of the rocks listed inside. Additionally a 'List of East Greenland catalogues' is pasted inside the front cover, enumerating all Wager's expeditions and underlining the sequence of rocks referred to in each book.

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Expeditions and research

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- Wager's handwriting being notoriously difficult to read, a series of copies was made in hard-backed notebooks labelled on the front and spine. The general sequence of East Greenland rocks B.164-B.169 includes an extra volume of later specimens collected in Knud Rasmussen Land in 1965 (B.170).
- | | |
|--------------|--|
| B.148-B.163 | Wager's notebooks |
| B.164-B.170 | Copy catalogues: Greenland rocks |
| B.171, B.172 | Copy catalogues: Skaergaard Intrusion |
| B.173-B.177 | Copy catalogues: Kangerdlugssuaq Intrusion |
| B.178-B.181 | Miscellaneous lists |
- B.148-B.163** **Wager's notebooks**
- B.148-B.151 Books I-IV, dating from the BAARE expedition 1930-1931.
- B.148 'I E.G.1-400'. Wager's label on the front cover reads 'Greenland Rocks 32-400'. Loose pages slipped inside are 'Nos. 1-64 collected from 13 July - 25 July 1930' and include samples from the Faroe Islands. The main notebook lists nos. 65-400, collected July 28 - August 29 1930.
- B.149 'II E.G. 401-725', 30 August 1930 - 28 January 1931.
- B.150 'III E.G. 726-891', 28 January - 25 June 1931.
- B.151 'IV E.G. 901-1033', 7-30 July 1931.
- B.152, B.153 Books V and VI, dating from Mikkelsen's expedition 1932.
- B.152 'V E.G. 1035 - 1322', 3 July - 14 August 1932.
- B.153 'VI E.G. 1323-1533', begins 15 August. No final date given.

Expeditions and research

- B.154-B.159 Books VII-XI, dating from the BEGE expedition 1935-1936.
- B.154 'VII E.G. 1601-1974', no opening date. Last entry 12 January 1936.
- B.155 'VIII E.G. 2000-2375', 16 January - 29 April 1936.
Note on first page of entries reads 'Numbers 1975 - 1999 not used'.
- B.156 'IX E.G. 2376-2586', 29 April (continued) - 23 June 1936.
- B.157 'X E.G. 2587 - 4062', 26 June - 20 July 1936.
- B.158 'XA E.G. 3450-3662'. No opening date. Last entry 29 July 1936.
These are part of the work in B.157, kept in a separate notebook by Wager. Rock nos. 3001-3052 and 3647-3662 are listed in another hand at the end of Wager's entries.
- B.159 'XI E.G. 4063-4353'. Begins 3 August 1936.
Later entries, by Wager and others, record rocks from other sites or presented by others.
- B.160-B.163 Books XII-XV, dating from the EGGE expedition 1953.
- B.160 'XII 4301-4536'. Begins 25 July - 6 August 1953.
These are Skaergaard Intrusion specimens.
- B.161 'XIII 4550-4940', 12-26 August 1953.
These are Kangerdlugssuaq Intrusion specimens.
- B.162 'XIV 4941-5315'. No opening date. Last entry 9 September 1953.
Kangerdlugssuaq and Skaergaard specimens.

Expeditions and research

- B.163 'XV 5316-5346'. No dates.
Entries, of Skaergaard Intrusion specimens, run 5316-5348, and are followed by 'Miscellaneous specimens from East Greenland' numbered 5349-5354.
- B.164-B.170 Copy catalogues: Greenland rocks**
- B.164 Greenland rocks 1 E.G. 1-402.
- B.165 Greenland rocks 2 E.G. 413-765.
- B.166 Greenland rocks 3 E.G. 766-1100.
- B.167 Greenland rocks 4 E.G. 1101-2144 (incomplete).
- B.168 Greenland rocks 5 E.G. 2145-3618.
- B.169 Greenland rocks 6 E.G. 3619-
Entries run to 5336.
- B.170 'East Greenland Catalogue E.G. 7064-'.
This is a black hard-backed notebook of a later date. Entries run to 7211. There is a map inserted, indicating sites of samples collected in Knud Rasmussen Land in 1965.
- B.171, B.172 Copy catalogues: Skaergaard Intrusion**
- Both these books have a note inside in Wager's hand 'Only copy (April 1959)'.
- B.171 Skaergaard Intrusion 1 E.G. 311-1974.

Expeditions and research

- B.172 Skaergaard Intrusion 2 E.G. 2266-4322.
- B.173-B.177 Copy catalogues: Kangerdlugssuaq Intrusion**
- All these books have a note inside front cover 'Only copy of original catalogue'.
- B.173 'I Kangerd. Int. Centre and West (catalogue with notes)'.
- B.174 'II West Kangerdlugssuaq and Amdrup Fjord (catalogue with notes)'.
- B.175 'III Kangerdlugssuaq Intrusion (catalogue with notes) Macrodykes and neighbouring rocks'.
- B.176 'IV Kangerd. Int. E.G.G.E. 1953 (catalogue with notes).4550-4945'.
- B.177 'V Kangerd. Int. E.G.G.E. 1953 (catalogue with notes) 4946-5050'.
- B.178-B.181 Miscellaneous lists**
- B.178 Wager's manuscript list of 'E.G. Collections, classified by journeys', and two typescript copies (all incomplete).
Wager's manuscript list of 'Kangerdlugssuaq Intrusion', by journeys.
- B.179 Typescript list of Wager's Greenland rocks, nos. 1-1033A, collected 1930, 1931, 56pp, made for E.A. Vincent by R. Buchanan (Secretary).
- B.180 Duplicated notes on Skaergaard Intrusion Layered rocks, and thin sections, with headnote 'Special teaching collection notes'.
- B.181 7pp typescript 'Catalogue of Skaergaard rocks collected by J. Douglas, August 20-26, 1962'. Numbers run E.G. 5401-5531; 3pp manuscript list of rocks, in the hand of G.M. Brown, probably collected on 1953 expedition.

Expeditions and research

B.182-B.252

EAST GREENLAND RESEARCH

1930s-1965

The notes and data at B.182-B.195 date from the 1930s and 1940s, a large proportion of the work being in Wager's own hand. The later work of the 1950s at B.196-B.224 relating mainly to geochemical analysis of Skaergaard Intrusion rocks, was done at Oxford when Wager had a larger department at his disposal, and includes data and results contributed by research students and by colleagues such as E.A. Vincent, G.M. Brown, W.J. Wadsworth and others. Even so, a substantial amount continues to be in Wager's hand.

The bulky folders to which Wager gave a very general title such as 'Kanderlug. I' usually contained smaller units of work kept separately with their own more detailed titles. These have all been retained while the outside folders have been discarded. Several of the files included correspondence, which has been left in place.

The petrographic notes at B.225-B.252 were originally contained in ring-back binders. These have been discarded, Wager's descriptions and labelling being retained. The work consists of petrographic descriptions or geochemical analyses of specific East Greenland rocks, each numbered and/or localised. The later notes on the Skaergaard Intrusion at B.231-B.246 have labels or indexes added by assistants but the notes themselves remain in Wager's hand. A date is often given; this refers to the compilation of the books. Wager's notes antedate these by many years.

B.182-B.224 Notes and data

B.225-B.252 Petrographic notes

B.182-B.224

Notes and data

B.182-B.184 Early work

B.185-B.195 Kangerdlugssuaq

B.196-B.224 Skaergaard

B.182-B.184

Early work

B.182

Extensive folder of work at the University of Reading from *ca* 1936, on numbered East Greenland rocks. Stereographic plots were made by rotating the specimens through multiple axes, all the work being done by hand using a Universal Stage.

There are notes on the use of the apparatus, by Wager and another, at the front of the folder. All the plots and calculations are by Wager.

Expeditions and research

- B.183 Green soft-backed notebook inscribed 'Universal Stage Felspars'.

Diagrams and calculations of optical determinations of numbered East Greenland rocks.

Both ends of book used. At front, feldspars. At rear, olivines.
- B.184 Extensive notes, calculations and narratives by W.A. Deer. Petrographic, mineralogical and chemical drafts on east Greenland rocks, none dated but probably sent to Wager on preparation for their major joint paper in *Medd. om. Grøn.* 1939.
- B.185-B.195 **Kangerdlugssuaq**
- B.185-B.188 'Kangerd. Int. I. Analyses. Chemistry notes and graphs'.

Contents of a folder so inscribed. Wager's own descriptions are given.
- B.185 'Kangerd. Int. I (1)'.

1. Rock analyses.
2. Feldspars.
3. Traces anal.
4. Early list incomplete.
5. Typed copy of analyses [by Deer].
- B.186 'Kangerd. Int. I (2)'.

Chemistry notes and graphs.
- B.187 'Kangerd. Int. I (3)'.

Analysis, comparisons and nomenclature.
- B.188 'Kangerd. Int. I (4)'.

1. Rock Analyses W.A.D.'s [Deer] originals.
2. Mineral Analyses.
3. Kap E. Holm analyses.
4. Recalculation of norms.

Includes correspondence and data 1947, 1953 from Deer.

Expeditions and research

- B.189-B.193 'Kangerd. Int. II. Petrology. Mineralogy'.
Contents of folder so inscribed. Wager's own descriptions are given.
- B.189 'Kangerd. Int. II'.
Petrology notes and ideas on petrogenesis (extensive notes, diagrams, calculations, one page dated 1946).
- B.190 'Kangerd. Int. II'.
Notes on minerals.
- B.191 'Kangerd. Int. II'.
Distribution of specimens into types.
List of all Metamorphic Complex specimens around Kangerdlugssuaq
- B.192 'Kangerd. Int. II'.
Notes on rocks for slicing and analysis, and work needed.
Colouring of maps. (one page dated 1950).
- B.193, B.194 'Kangerd. Int. III. Letters. Abstracts and references'.
Contents of a folder so inscribed. Wager's own descriptions are given.
- B.193 'Kangerd. Int. III (1)'.
Letters Alex [Deer, 1940-1947].
Letters Noe-Nygaard *re* Ilimausat specimens.
- B.194 'Kangerd. Int. III (2)'.
References and abstracts relevant to it.

Expeditions and research

- B.195 'Kangerd. Int. IV'.
(analyses by Deer).
- B.196-B.224 **Skaergaard**
- B.196, B.197 'Skaergaard Int. Explanation of modes. Early notes'.
Contents of a folder so inscribed. Wager's own descriptions are given.
- B.196 Miscellaneous plots and calculations.
- B.197 Early explanations of modes November, December 1956 (some notes dated October 1956).
- B.198-B.201 'Skaergaard Int. Modes'.
Contents of a folder so inscribed. Wager's (or assistant's) own descriptions are given.
- B.198 Modes Marginal Border Group 1957.
- B.199 Modes Layered series LZ a, b, c.
- B.200 Modes Layered series MZ.
- B.201 Modes Layered series UZ a, b, c.
- B.202 'Skaergaard Int. P₂O₅'.
Notes, data, calculations, drafts by Wager and colleagues on phosphorus in Skaergaard rocks, some dated May, August 1959. Includes draft of a paper by E.A. Vincent and W.D. Curren 'The radiochemical determinations of phosphorus in silicate rocks,' latest ref. 1958.

Expeditions and research

- B.211 Skaergaard Olivines (work by E.A. Vincent 1958, 1962).
- B.212 Skaergaard Pyroxenes (work by E.A. Vincent, various dates 1955-1960, also work by W.A. Deer and P.E. Brown).
- B.213 Skaergaard Magnetite anal. (work by E.A. Vincent 1953, 1959).
- B.214 Mg, Ca, isotope ratios.
- B.215 K, Rb, Cs also K, Na (includes work by E.A. Vincent, S.R. Taylor, A.A. Smales, C.J. Liebenberg, various dates 1953-1958, correspondence).
- B.216 Gold (includes work by E.A. Vincent 1957).
- B.217 Uranium in Skaergaard (work by E.I. Hamilton).
- B.218 Cerium (correspondence only, 1956).
- B.219 Palladium in Skaergaard (work and correspondence by E.A. Vincent 1955).
- B.220 Sulphur in Skaergaard rocks (includes work on other elements, work by E.A. Vincent 1955, and by others 1955-1957, and correspondence).
- B.221 Miscellaneous notes on analyses.
- B.222, B.223 'Skaergaard Int. General Notes'.
Contents of a folder so inscribed. Notes, ideas, diagrams, drafts, a little correspondence, by Wager and colleagues, probably for papers on layered intrusions and the posthumous collaborative book with G.M. Brown.

Expeditions and research

- B.222 'General notes 1956, 7, 8'.
Notes, calculations, information etc. Some dated 1953 and some 1959, and including work by G.M. Brown, W.J. Wadsworth.
- B.223 Notes, calculations, diagrams etc., most dated 1959, some 1957 and including notes by Wager 'in America 1962' and work by G.M. Brown dated by Wager 1965.
- B.224 'In preparation'.
Miscellaneous notes and diagrams, some dated 1959, 1964.
- B.225-B.252 Petrographic notes**
- | | |
|-------------|-----------------|
| B.225-B.230 | Kangerdlugssuaq |
| B.231-B.246 | Skaergaard |
| B.247-B.252 | Miscellaneous |
- B.225-B.230 **Kangerdlugssuaq**
- B.225 Kangerdlugssuaq Intrusion I.
Quartz nordmarkite; nordmarkite; transitional syenite; pulaskite.
- B.226 Kangerdlugssuaq Intrusion II.
Felspathoid-poor foyaite; macrodykes; other tertiary plutonic rocks. Some dated 1946.
- B.227 Kangerdlugssuaq Intrusion III.
Inclusions; Pk 2005 [a peak 2005 m.high] series; veins. Some dated 1946.

Expeditions and research

- B.228 Kangerdlugssuaq Intrusion IV.
- Snout series; January nunataks; Kaerven intrusion; peridotite; Jagtlegven intrusion; Bagnaessit intrusion; unclassified. Some dated May 1946.
- B.229 Kangerdlugssuaq Intrusion V.
- Classification of hand specimens; biotite content and other notes, with a manuscript note 'Done in Greenland 1935-6'; moraine of Kangerdlugssuaq glacier.
- B.230 Kangerdlugssuaq Intrusion VI EGGE 1953.
- Felspars; veins: location of thin sections cut from hand-specimens.
- B.231-B.246 **Skaergaard**
- B.231 Skaergaard Intrusion 1.
- Marginal border group; northern border group; western border group (Kraemers Island). Also includes Wager's 'Note on arrangement of slices March 1947'.
- B.232 Skaergaard Intrusion 2.
- Marginal border group; western border group. Some dated 1959.
- B.233 Skaergaard Intrusion 3.
- Marginal border group; eastern border group northerly, southerly; southern border group. Some dated 1959.
- B.234 Skaergaard Intrusion 4.
- Layered series LZa. Dated 1959.
- B.235 Skaergaard Intrusion 5.
- Layered series LZb, LZc. Dated 1959.

Expeditions and research

- B.236 Skaergaard Intrusion 6.
Layered series LZb and c Kraemers Island; MZ Kraemers Island. Dated 1959.
- B.237 Skaergaard Intrusion 7.
Layered series; MZ Pukugaqryggen and Gabbro Mt.; UZa and b Pukugaqryggen and Gabbro Mt. Dated 1959.
- B.238 Skaergaard Intrusion 8.
Layered series; MZ and UZa Islands of Skaergaarden; UZa House area and flanks of Basistoppen. Dated 1959.
- B.239 Skaergaard Intrusion 9.
Layered series; UZb House area and flanks of Basistoppen; UZa and b Skaergaardshalvö. Dated 1959.
- B.240 Skaergaard Intrusion 10.
Uppermost layered series and UBG [Upper Border Group]; UZc Basistoppen and Skaergaard Bay; UZc Nunatak I; UZb and c Nunatak II and nearby Kilen; UBG γ [gamma] and β [beta] Basistoppen; UBG Nunatak I. Dated 1962, 1963.
- B.241 Skaergaard Intrusion 11.
Upper border group; UBG α [alpha] and γ [gamma] Brødretoppen; UBG Osttoppen; UBG Sydtoppen-Tinden ridge and foot; UBG α [alpha], β [beta] and γ [gamma] Hammersdal and Kilen. Dated 1962.
- B.242 Skaergaard Intrusion 12.
Late granophyres; transitional granophyres; Tinden granophyre sill; vein granophyres. Inclusions. Dated 1962, 1963.

Expeditions and research

- B.243 Skaergaard Intrusion 13.

Basistoppen Sheet; Basistoppen E-W; Osttoppen; Basisgletscher; Kabbernunatak; small nunatak on Brødregletscher; Skillenunatak; S. side Brødregletscher. Dated 1962.
- B.244 Skaergaard Intrusion 14.

Dykes; country rocks; metamorphic complex; basalts, tuffs and sediments; Hanging Cape and Hammersdal sills; macrodyke. Dated 1959, 1962.
- B.245 Skaergaard Intrusion.

Opaque minerals: polished specimens; iron ores (various dates 1949-1955); sulphides.
- B.246 Skaergaard Intrusion.

Notes on hand specimens.
- B.247-B.252 **Miscellaneous**
- B.247 Angmagssalik granite and related rocks.

Metamorphic complex (some pages with a note 'January 1930 confirmed Oct. 1933').
- B.248 Tertiary Dykes.

Erratics.
- B.249 Lavas (early work, with a later note 'Quick look through in Nov. 1948').

Tuffs.

Tertiary sediments.

Sills.

Expeditions and research

- B.250 Trace Elements.
- Skaergaard.
Kangerdlugssuaq.
Miscellaneous Greenland.
Skye, Lewisian, Mount Everest.
- Includes drafts and notes on results and progress, also notes of materials sent to or received from colleagues (R.L. Mitchell, E.A. Vincent, J. Sutton, A.A. Smales, D.Flinn) various dates 1945-1958.
- See also F.14-F.38.
- B.251, B.252 Two small hard-backed white notebooks.
- B.251 East Greenland Rocks.
- Metamorphic complex.
- B.252 Tertiary Igneous Rocks.
- East Greenland.
- Lavas.
Tuffs.
Sediments.
Dikes.

B.253-B.307

EVEREST 1933

1932-1963

The leader of the 1933 Everest Expedition was H. Ruttledge; the secretary was J.M. Scott who had been a member with Wager of the 1930 BAARE expedition to Greenland. Permission for the Everest attempt was granted in August 1932; the climbers left Great Britain in January 1933, arrived in India in February and returned in September.

In October 1932 Wager had been giving prime consideration to a further expedition to Greenland (see B.23, B.25) but in the same month the opportunity arose for him to be invited to join the Everest team (B.253) and work in Greenland was deferred (B.27).

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Expeditions and research

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The expedition brought Wager national and international renown. As a member of one of the assault parties, he and P. (later Sir Percy) Wyn Harris made the first reconnaissance from Camp VI and, it had been hoped, an attempt on the summit on 30 May. They reached a point higher than had previously been achieved, finding an ice-axe from Mallory's and Irvine's 1924 expedition along the way, but adverse snow conditions obliged them to turn back. The second assault party of F.S. Smythe and E.E. Shipton was also unsuccessful.

As a geologist, Wager's opportunities were restricted by the requirements of the climbing expedition. Nevertheless, he secured a collection of 244 rock specimens, and was able to make observations (later published) on the river drainage pattern and the rise of the Himalayan range.

B.253-B.259	Organisation and arrangements
B.260-B.272	Lectures and publications
B.273-B.285	Later correspondence and papers
B.286-B.288	Rock catalogues
B.289-B.305	Research
B.306, B.307	Press cuttings

B.253-B.259	Organisation and arrangements	1932-1933
B.253	Correspondence and arrangements for Wager's invitation to join the expedition, his medical examination, personal and official correspondence, request for leave of absence from the University of Reading, text of official Agreement. October 1932 - January 1933. An undated letter from J.M. Scott (Secretary to the Expedition) refers to the memorial service for H.G. Watkins. See also B.23, B.25, B.27 for correspondence on Wager's East Greenland plans, over-ridden and deferred by the Everest expedition.	
B.254	Correspondence with colleagues on possible scientific work to be undertaken during the expedition: fossils, gravity observations.	
B.255	Miscellaneous items: reading list, Wager's notes, recommended equipment, medical notes, Wager's brief notes on his passage through Suez Canal on the outward journey.	

Expeditions and research

- B.264, B.265 Drafts for two publications for *Himalayan Journal* 1934. Neither listed in Bibliography.
- B.264 'Mount Everest and the weather in 1933', 9pp, many corrections.
- B.265 'The first crossing of the Lhonak La', 6pp.
- B.266-B.271 Writings and notes on the Arun River and the rise of the Himalaya.
- B.266 'The valleys of Sikkim and the Mount Everest neighbourhood - physiographic observations during the 1933 Mount Everest expedition'. Very heavily corrected manuscript draft, undated, perhaps *ca* 1934.
- B.267 'The origin of the drainage pattern in the Mount Everest region and Sikkim'. Heavily corrected manuscript draft, undated, perhaps *ca* 1934.
- B.268 'Evidence that the Arun etc. did not cut back through the range'. Shorter manuscript notes.
- B.269 'The Arun river drainage pattern and the rise of the Himalaya', draft for paper published in *Geol. J.* **89**, 1937, with letter and comments from A.A. Miller 1936.
- B.270 Correspondence 1950 on proposed Nepalese dam in Himalaya.
- B.271 'The Lachi series of North Sikkim and the age of the rocks forming Mount Everest', heavily-corrected manuscript draft for paper published in *Rec. Geol. Surv. India*, **74**, 1939, with correspondence from colleagues.
- B.272 Correspondence with colleagues 1933-1935 on Everest specimens, research, thanks for copies of Everest publications.

Expeditions and research

B.273-B.285	Later correspondence and papers	1933-1963
	<p>Most of this material relates to the affairs of the Mount Everest Committee and successor bodies, its organisation and membership, with special reference to the scope, timing and leadership of Himalayan expeditions.</p> <p>Wager served on the Committee until 1947 and was frequently consulted both officially and personally on various matters of concern. Wager later served on the Himalayan Joint Committee of the Royal Geographical Society and the Alpine Club.</p>	
B.273	1933 (1).	
B.274	1933 (2) Conditions and fees for lectures, guest-list for welcome dinner 7 November.	
B.275	1934 February - July.	
B.276	1934 October - December. Agenda and minutes of meetings, 4pp manuscript notes by Wager on organisation and leadership qualities for expeditions.	
B.277	1935 January - May. Committee meeting, correspondence on leadership.	
B.278	1937.	
B.279	1939. Includes proposed attempt on Everest in autumn 1939, with comments by Wager.	
B.280	1947. Reorganisation of committee, Wager's resignation.	
B.281	1948. Correspondence and comments by Wager on geological work by proposed expedition to Nepal, and some shorter correspondence.	

Expeditions and research

- B.282 August 1951 - January 1952. Reconnaissance expedition by E.E. Shipton and possible collaborative attempt with a Swiss expedition in 1952. British plans were deferred in favour of a major expedition in 1953.
- B.283 1952 May - December. Correspondence and papers, mainly on 1953 plans, and the choice of leader. J. (later Lord) Hunt was eventually preferred over E.E. Shipton, from whom papers and submissions are included.
- B.284 1953. Includes manuscript draft and published version of Wager's article 'What it feels like on Everest' published in *Picture Post* 4 July 1953 to celebrate the successful expedition. Not in Bibliography. Also includes a postcard from J. Hunt.
- B.285 1960-1963. Correspondence, papers and material relating to a claim that a Chinese expedition had climbed Everest from the North face in May 1960 without oxygen. A photograph and film were produced in support of the claim, which aroused intense interest and controversy, particularly with reference to the exact identification of the time and place of the photograph.
- Correspondence is with colleagues, officials of the Alpine Club and Mount Everest Foundation, and others. Drafts and material for articles by Wager (*Alpine Journal*, **LXVIII**, May 1963) and by H. Merrick are included.
- A copy of Swiss Alpine Club's *Bulletin Mensuel* March 1961, in which the 'Chinese Photograph' was first published, relevant photographs and diagrams by Wager and Merrick, and press cuttings are included. Also included with the correspondence is the draft of Wager's review of F.M. Bullard: *Volcanoes, in history, in theory and in eruption* (not in Bibliography).
- B.286-B.288 Rock catalogues**
- B.286 Small black notebook 'Catalogue of Mount Everest Exped. 1933'. 244 specimens are listed by Wager in 1933; a further list of rocks collected by members of the 1953 expedition, principally by G.E. Band, is added in another hand.
- B.287 Small hard-backed notebook 'Everest Descriptions', containing extracts from Wager's 'Everest Geology I' (App. 20), probably copied by G.R. McLachlan in 1953 (information from E.A. Vincent).
- B.288 'Catalogue of Mount Everest Expedition Rocks'. Typescript list of 244 specimens.

Expeditions and research

B.289-B.305	Research	1933-1954
	B.289-B.299	Weather
	B.300, B.301	Plants
	B.302-B.305	Geology
B.289-B.299	Weather	
B.289	Hard-backed Government of India Meteorological Department 'Pocket Register for Meteorological Observations', Observations almost all in Wager's hand, 25 March - 2 July.	
B.290	'Weather Log. Camp I'. Loose pages from a 'Pocket Register'.	
B.291	'Camp II Weather Log'. Loose pages from a 'Pocket Register'.	
B.292	'Camp III Weather Log'. Loose pages from a 'Pocket Register'.	
B.293	Loose pages from a 'Pocket Register'. Not in Wager's hand.	
B.294	Pages from a hard-backed notebook. Observations by Wager.	
B.295	Notes, graphs on temperature and pressure.	
B.296-B.298	Three envelopes of photographs of cloud formations on Everest June 15, 17, 20.	
B.299	Correspondence on weather on Everest 1933-1934. Includes information on meteorological information required from expedition, correspondence with colleagues, report on tests by National Physical Laboratory on the barometer used at 'Barr [Base] Camp'.	

Expeditions and research

- B.300, B.301 **Plants**
- B.300 Correspondence 1933-1934 with Royal Botanic Gardens, Kew, on identification of specimens brought back from Everest.
- B.301 Manuscript drafts and proofs, all heavily corrected, of 'List of plants collected in the Rongbuk Valley', published in *Everest 1933* as 'Observations no.VI'. Not in Bibliography.
- B.302-B.305 **Geology**
- B.302 Note of thanks for fossil specimens collected on Lache Spur Tibet, and presented by Wager to British Museum (Natural History) 1933.
- B.303 'Examination of limestone and sandstone from Everest', 4pp manuscript report of analysis by P.S. Walder (University of Reading).
- B.304 Notes, data, diagrams, maps, mainly on Arun river drainage, probably related to paper in *Geol. J.* **88**, 1937 (see B.269).
- B.305 Diagrams, calculations, graphs, related photographs of chemical work on Everest rocks, by R. Hall and R.St J. Lambert *ca* 1954. A note on the work, by E.A. Vincent 1998, is included in the folder.
- B.306, B.307 **Press cuttings**
- B.306 Despatches and narratives.
- B.307 Pictures.

Expeditions and research

- B.323 Manuscript and typescript list of 'Galway granite and related rocks collected by L.R. Wager August 1957'. 1p only.
- B.324-B.343 Research notes and drafts 1928-1930, n.d.**
- B.324 'General notes on geology of Roundstone'. Manuscript notes, 1p dated 'Michaelmas Term 1928'.
- B.325 'Essays on aspects of Roundstone geology'. Heavily corrected manuscript drafts, n.d.
- B.326 Folder of notes and analyses of Roundstone and other Irish rocks, a few pages dated 1930.
- B.327 Small notebook, mainly sketches of rock formations.
- B.328 Envelope of 'Sketches of rocks etc. Connemara', dated March, April 1929.
- B.329 Sketch map prepared for 1930 paper, and other sketches and diagrams.
- B.330 Hand coloured traced map, no date, author or indication of publication.
- B.331, B.332 'Index of rock slices Connemara I and II'. Two exercise books of manuscript notes by Wager.
- B.333 'Minerals Connemara'. Exercise book of manuscript notes (not all pages used).
- B.334 'Wexford'. Exercise book of manuscript notes on rock slices of the Courtown district Co. Wexford (few pages used).

Expeditions and research

- B.335-B.343 Sequences of petrographic descriptions, sketches and notes, originally held in looseleaf binders that have been discarded. Wager's headings and descriptions are retained.
- B.335 'Connemara. Diorites Malchites Gabbros'.
- B.336 'Connemara. Transgression granites Late dikes'.
- B.337 'Connemara. Epidiorites Hornblende Schists'.
- B.338 'Connemara. Granite gneiss Diorite gneiss Granites Composite gneiss'.
- B.339 'Connemara' (notes on argillaceous and arenaceous metamorphosed sediments).
- B.340 'Connemara Unclassified'.
- B.341 'Ultrabasic rocks of Errisbey Intrusion and their alteration products'.
- B.342 'Letterclife Tarn group of early picrites and related rocks'.
- B.343 Drawings of thin sections as seen under microscope.
- B.344, B.345 Correspondence 1928-1958**
- B.344 Brief correspondence 1928-1929 on Wager's planned visit and research. Includes letter from collaborator G. Andrew.
- B.345 Letters of thanks and comment on Wager's papers on Irish rocks. Various dates 1930-1937 and one later letter 1958.

Expeditions and research

- B.346** **Maps**
- B.346 Annotated maps of Antrim, Connemara (2), Galway, Roundstone, Wexford.

B.347-B.391 **SCOTLAND** **1925-1965**

Wager's first visits to Scotland were in 1925 and 1926, to Edinburgh and Arran respectively, while he was still an undergraduate at Cambridge. Little documentation survives for these early visits (B.347, B.354, B.355) but one of the group leaders at Edinburgh was E.B. (Sir Edward) Bailey, an authority on Scottish rocks with whom Wager published a collaborative paper in 1953. The leader on Arran was G.W. Tyrrell who also became a colleague.

Wager's geological diaries of Hebridean expeditions (Appendix, App. 36-App.42) begin in April 1946, dating from his period at the University of Durham. They reflect his growing interest in the British Tertiary Igneous Province and may in part derive from the difficulty of organising further expeditions to Greenland at that time. Publications on the geology of Rhum and Skye began in 1946 and continued until the year of his death.

In 1948 Wager was one of the leaders of the excursion to Skye and Morar during the International Geological Congress (B.348 and *passim*) and the Hebridean area remained a regular destination for the University of Oxford Department field excursions (B.352, B.353). Wager's geological diaries stop in 1961 though it is clear that he went on expeditions after that date.

- | | |
|-------------|-------------------------------|
| B.347-B.353 | Organisation and arrangements |
| B.354-B.361 | Field notebooks and diaries |
| B.362-B.367 | Correspondence |
| B.368-B.377 | Rock catalogues |
| B.378-B.390 | Research notes and drafts |
| B.391 | Maps |

B.347-B.353 **Organisation and arrangements** **1925, 1948-1965**

The surviving documentation covers only a few of Wager's many visits. The full list is in the geological diaries App.36-App.42. See also B.449.

Expeditions and research

- B.347 Sedgwick Club excursion to Edinburgh, 8-16 April 1925.
Programme of events, sketch by Wager, related printed material (a few annotations).
- B.348 Excursions during International Geological Congress, 1948.
Wager was a member of Excursion A.12 to Mull and Ardnamuchan 6-22 August (see B.358). However, most of the material relates to excursion C.14 to Skye and Morar on which Wager was one of the leaders and co-author of the Guide, a copy of which is enclosed (see also H.8-H.10). Folder includes extensive manuscript draft 'State of our knowledge of the geology of Skye', related maps and diagrams and Wager's 'Notes for introductory talk on Central Skye Complexes'.
- B.349 Visit to Rhum, July 1950, with W.F. Cassie.
Permission to visit island, accommodation, transport and food, correspondence with colleagues. The visit resulted in a collaborative paper with G.M. Brown (*Geol. Mag.*, **88**, 1951) whom Wager refers to in correspondence as 'a first class man, and probably I should say the best student I ever had' (letter of 14 April 1950). Brown continued to work on the ultrabasic rocks of Skye for his D.Phil. (B.379).
- B.350 Visits to Rhum, 1951, 1952.
Permission to visit and work on island, organisation and transport. Includes a letter from G.M. Brown, also two sketches of Allival by Wager 17 July 1951.
- B.351 Visit to St Kilda July-August 1952.
Permission to visit island (the Laird, the Marquess of Bute, did not permit the collection of specimens), funding grants, correspondence and information from colleagues, food and transport, Air Ministry photographs, comments on Wager's paper 'Extent of glaciation in the Island of St Kilda' and arrangements for publication (*Geol. Mag.* **90** 1953), exchanges of photographs, continuing shorter correspondence 1952-1960.
Photographs of St Kilda are in Section M.
- B.352, B.353 Oxford University Department excursions to Scotland, chiefly to Skye, also to Ardnamurchan and Glencoe (1964, organised by G.M. Brown), 1951, 1961, 1963, 1964, 1965.

Expeditions and research

- B.352 Shorter correspondence, brief notes by Wager, lists of participants and members of department.
- B.353 Reading lists, expedition notes (some by G.M. Brown), annotated maps.
- B.354-B.361 Field notebooks and diaries**
- B.354 Notebook 'Sedgwick Club Edinburgh April 1925'. Excursions with E.B. Bailey, April and May.
- B.355 Notebook 'Sedgwick Excursion Arran 1926'. Notes and sketches (none dated), and notes on talk or lecture by G.W. Tyrrell.
- Enclosed are a letter January 1938 from Tyrrell referring to 1926 excursion and Wager's plan to return there with University of Reading students, and Wager's notice of the excursion 17-25 March [1938].
- See M.48 for a photograph taken on the 1926 excursion.
- B.356 Small black pocket notebook of miscellaneous content. Notes for International Geological Congress visit to Skye 1948 'with additions 1963'; notes at Paris and Auvergne 1957; Skye July 1951; Clermont Ferrand April 1963; Skye April 1963, April 1964. A few notes at rear of book.
- B.357 Softbacked blue notebook, few pages used. Notes and sketches on Skye, n.d. perhaps during 1948 excursion.
- B.358 Notebook 'I.G.C. 1948 Ardnamurchan and Mull. Leaders: Richey and Bailey'. Both ends of book used. Detailed notes and sketches of excursions by both leaders.
- B.359 Typescript pages of diary 'Hebrides I' (App.36) of visits to Skye, various dates 1947-1951.
- B.360, B.361 'St Kilda Diary 1952'. Typescript pages of diaries 'Hebrides V and VI' (App.40, App.41) B.361 has some manuscript corrections by Wager.

Expeditions and research

- | B.362-B.367 | Correspondence | 1950-1963 |
|--------------------|---|------------------|
| B.362 | Correspondence with Air Ministry on aerial photographs requested and supplied, mainly of Skye. Various dates 1950-1957. | |
| B.363 | Manuscript and notes on the geology of Skye and Rhum, by E.B. Bailey, sent to Wager, n.d., latest reference 1953. | |
| B.364 | Correspondence 1955-1956, chiefly on the publication and presentation of G.M. Brown's paper on the ultrabasic rocks of Rhum. Includes Wager's notes for the meeting at the Royal Society when the paper was read, comments on work etc. (See B.379). | |
| B.365 | Shorter correspondence on Skye rocks 1956. | |
| B.366 | Correspondence on the geology of Rhum 1956, 1958, 1960. Includes a 'Conspectus of the geology of Rhum' 1960, by W.A. Macfadyen. | |
| B.367 | Correspondence and geological notes on Ardnamurchan by A.G. MacGregor 1962-1963. Includes paper and sketches by MacGregor. | |
| B.368-B.377 | Rock catalogues | |
| | B.368-B.372 are Wager's small black notebooks numbered on the spine in Roman numerals I-V, with a front cover label bearing the numbers of the rocks listed inside with the code letter H = Hebrides. Additionally, a 'List of Hebridean Catalogues' is pasted inside the front cover enumerating each of Wager's visits and underlining the sequence of rocks referred to in the book. B.373 is included with these 'original' notebooks but deals with specimens collected in the Cuillin Hills of Skye by J.M. Carr of the Oxford University Department. | |
| | B.374-B.377 are copy catalogues made in the Department. | |
| B.368 | I H.1-H.465, Skye 1946-1947. | |
| B.369 | II H.466-H.4045, Skye 1947-1949. | |

Expeditions and research

- B.370 III H.4051- , Skye 1950-1961.
Entries run 4051-4408 in Wager's hand, then continue in hands of G.M. Brown and others. Last dated entry is Easter 1961.
- B.371 IV H.3001 - ,1948-1960
Entries run 3001-3502 in Wager's hand then continue in various hands. Last dated entry is 1960. Specimens are from various Hebridean sources and also include Northern Ireland.
- B.372 V H.3712-H.3769, 1962-1964
Included in the sequence of Wager's notebooks but not in his hand. Specimens from various Hebridean sources. Few pages used.
- B.373 Red notebook, labelled 'Original' but not Wager's. Specimens from the Basic Igneous Complex of the Cuillins collected by J.M. Carr, numbered J.1-J.587.
- B.374 Copy catalogue Skye I H.1-H.999 and H.4001-H.4191.
- B.375 Copy catalogue Skye II H.4192 -. Entries run to H.4610.
- B.376 Copy catalogue. Miscellaneous Hebridean Rocks H.3001 -.
Entries run to H.3790.
- B.377 Copy catalogue St Kilda H.3256-H.3264, H.3335-H.3502.
- B.378-B.390 Research notes and drafts**
B.378-B.384 are notes and analyses of Hebridean rocks, chiefly of Rhum and Skye, often including work by E.A. Vincent, G.M. Brown, B.A. Collett and other assistants.

/...

Expeditions and research

/... Of interest are Wager's early notes on Harker's 1908 work on the ultrabasic rocks on Rhum (B.378) and the manuscript draft of G.M. Brown's thesis 'The ultrabasic rocks of Rhum', supervised heavily and corrected by Wager (B.379).

B.385-B.390 are petrographic descriptions similar to those on East Greenland rocks at B.225-B.252. The original ring-back binders have been discarded and descriptions retained. The labelling and some of the work are not by Wager.

B.378-B.384 Notes and data

B.385-B.390 Petrographic descriptions

B.378-B.384 **Notes and Data**

B.378 Wager's notes on Harker's *Survey Memoir*. 2pp headed 'Abstracted at Cambridge', 28pp headed 'Abstracted at Reading', 2pp 'Summary of Progress' with dates 1934-1938.

B.379 'The layered ultrabasic rocks of Rhum, Inner Hebrides', D.Phil. thesis of G.M. Brown. Manuscript draft with manuscript corrections by Brown and Wager, who was Brown's supervisor.

B.380 'Skye analyses. EAV's [E.A. Vincent] original sheets' 1949-1953. Also work by G.M. Brown, B.A. Collett 1956.

B.381 Trace elements in Skye rocks, work by Wager, E.A. Vincent and others, some dated 1955. Notes, tables, calculations.

B.382 Tables, analyses, norm calculations of numbered rock specimens.

B.383 Tables of analyses.

B.384 Detailed analyses of numbered Skye rocks.

Expeditions and research

- B.385-B.390 Petrographic descriptions**
- B.385 Skye 1 Raasay. Metamorphics. Sediments. Lavas. Tuffs and Agglomerates. Cuillin Complex. Gabbro.
- B.386 Skye 2 Western Redhills Complex. Epigranites. Porphyritic Felsites. Porphyritic Epigranite.
- B.387 Skye 3 Western Redhills Complex. Marsco and East.
- B.388 Skye 4 Western Redhills Complex. Marscoite Suite. Marsco Epigranite (some work by J.D. Bell).
- B.389 Skye 5 Broadford Complex and miscellaneous granites.
- B.390 St Kilda.
- B.391 Maps**
- B.391 Ordnance Survey sheets, marked or annotated for expeditions: Arran, with a covering letter from M. MacGregor 1939; Rhum, with a list of rocks by G.M. Brown; St Kilda; Skye.
- 1 box.
- B.392-B.404 SOUTH AFRICA 1958, 1959, 1968**

Wager visited South Africa only once, for two months June-August 1958, in the company of G.M. Brown in order to conduct research on layered intrusions for their joint book. They visited the Great Dyke in Southern Rhodesia (now Zimbabwe) and the bushveld and mines of Transvaal.

/...

Expeditions and research

/... There is no surviving material on the organisation and logistics of the expedition and very little correspondence.

B.392 Correspondence

B.393-B.396 Rock catalogues

B.397-B.403 Research

B.404 Maps

B.392 Correspondence

B.392 Brief correspondence only, 1958, 1959, 1968, mainly addressed to G.M. Brown.

B.393-B.396 Rock catalogues

B.393-B.395 are Wager's small black notebooks. B.396 is a copy catalogue made in the Department.

B.393 SA I 1-484 Great Dyke and Bushveld. Both ends of book used. Some entries are in the hand of G.M. Brown.

B.394 SA II 485-880 Bushveld.

Both ends of book used.

B.395 SA III SA881-1070 Bushveld, Insigwa and Witwatersand.

B.396 Copy catalogue.

B.397-B.403 Research

B.397-B.400 Notes and data

B.401-B.403 Petrographic descriptions

Expeditions and research

- B.397-B.400 **Notes and data**
- B.397 Notes on the literature. Brief draft on 'Great Dyke of S.R. [Southern Rhodesia]'.
B.398 Tabulated data on succession of Eastern Bushveld layered rocks.
B.399 Diagrams and tables of sites and strata, sent to Wager from various sources in South Africa, some with title, notes or information added by him.
B.400 Rock data and mineral deposits of Eastern and Western Bushveld, in vertical tabulation.
- B.401-B.403 **Petrographic descriptions**
- Petrographic descriptions of thin sections of numbered specimens of South African rocks. The original ring-back binders have been discarded and the descriptions retained. The labelling, and some of the work, are not by Wager.
- B.401 South Africa 1958 I.
 Descriptions of thin sections.
B.402 South Africa 1958 II.
 Position of thin sections on cut surfaces of hand specimens, 618-897.
B.403 South Africa 1958 III.
 Descriptions of thin sections.
- B.404 Maps**
- B.404 Geological, mining and area maps of Southern Rhodesia and South Africa, most annotated.

Expeditions and research

B.405-B.415

WEST INDIES

1959-1965

Wager's research visit to the West Indies was relatively short (30 October - 24 November 1959) but productive for further work in vulcanology. He visited Trinidad, St Vincent, St Lucia, St Kitts, Nevis, Montserrat and Antigua, in the company of G.R. Robson, a former research student at Durham, then working at the Seismic Research Institute at Trinidad.

Immediately on his return (letters of 10 and 11 December in B.405) Wager began to plan a programme of research. He obtained grants for research students to undertake field work, under his supervision and that of G.M. Brown, which was continuing at the time of his death.

Wager's publication, 'Igneous cumulates from St Soufrière St Vincent' appeared in 1962 (*Bull. Volcanologique* 204).

B.405	Organisation and arrangements
B.406	Rock catalogue
B.407-B.409	Correspondence
B.410-B.415	Research

B.405

Organisation and arrangements

1959-1961

B.405

Correspondence and papers March 1959 - January 1961.

Arrangements, funding, schedule and programme for Wager's visit, correspondence with G.R. Robson and other colleagues, plans for future work.

B.406

Rock catalogue

1959

B.406

Small black notebook. Rocks numbered T.701-T.849 in Wager's hand. Entries continue T.851-T.912 in another hand and from other collectors.

Expeditions and research

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|--------------------|--|---------------------------|
| B.407-B.409 | Correspondence | 1960-1965 |
| B.407 | Correspondence and papers mainly with Department of Scientific and Industrial Research on funding for Wager's research project and students in West Indies, 1960-1962.

Includes grant application, budget estimates, reports on work completed etc. | |
| B.408, B.409 | Correspondence and papers mainly with colleagues and research students working in West Indies, 1960-1965.

Includes copy of note 'Research on West Indian Volcanoes' (<i>Nature</i> , 191 , 15 June 1961) (not in Bibliography), visits, committees, reports on research completed 1963, 1964. | |
| B.408 | 1960-1962. | |
| B.409 | 1963-1965. Includes arrangements for J.T. Wilson to visit Oxford Department. | |
| B.410-B.415 | Research | |
| | B.410-B.413 | Notes and data |
| | B.414, B.415 | Petrographic descriptions |
| B.410-B.413 | Notes and data | |
| B.410 | Notes, draft, material for Wager's paper on St. Soufrière volcano, St. Vincent (<i>Bull. Volcanologique</i> , 204 , 1962). | |
| B.411 | Bulletins and Annual Reports of Seismic Research Unit, Trinidad. | |
| B.412 | Analyses of feldspars in St Vincent rocks by E.A. Vincent, 1960. | |

Expeditions and research

- B.413 Bibliographical references to work on West Indian Volcanoes.
- Lists of rocks and specimens of West Indian rocks, taken from published papers, with manuscript notes by Wager and others on further checking and correction to be done.
- B.414, B.415 **Petrographic descriptions**
- Petrographic descriptions, some with photographs, of numbered specimens of West Indies rocks. The original ring-back binders have been discarded and the descriptions retained. The labelling, and some of the work, are not by Wager.
- B.414 West Indies I (specimens from St. Vincent).
- B.415 West Indies II (specimens from St. Vincent, St. Vincent Grenadines, Grenada).
- B.416-B.441 YORKSHIRE 1925-1949**
- Born and educated in Yorkshire, Wager explored the Dales from boyhood, by bicycle, on foot and later as a climber. His father rented a holiday house in Littondale, which became a centre for such expeditions and early geologising. In 1940 Wager bought a house of his own in the Yorkshire Dales which remains in family hands.
- Perhaps this early connection was a factor in his choice of the Whin Sill and Great Scar Limestone for his first research on graduating from Cambridge supported 1926-1929 by a Goldsmiths' Company Research Scholarship. His supervisor, W.B.R. King, also had a holiday home in the Dales.
- Subsequently, Yorkshire, especially Teesdale, became a regular destination for Wager's field courses for his Durham University students; he also led professional excursions in the area. The material presented under 'Organisation and arrangements' relates to these later visits, while the field notebooks and research record earlier work.

/...

Expeditions and research

/...	B.416-B.423	Organisation and arrangements
	B.424, B.425	Correspondence and draft
	B.426-B.429	Field notebooks
	B.430, B.431	Rock catalogues
	B.432-B.440	Research
	B.441	Maps

B.416-B.423	Organisation and arrangements	1944-1949
B.416-B.420	University of Durham excursions to Teesdale.	
B.416	Manuscript 'Notes for 3 day excursion in 1944'.	
B.417	Teesdale 1945. Correspondence, accommodation, notices, Wager's manuscript notes.	
B.418	Teesdale 1946. Correspondence, accommodation, notices, participants, maps.	
B.419	Teesdale and Weardale 1947. Correspondence, accommodation, notices, participants.	
B.420	Teesdale 1948. Correspondence, accommodation, notices, participants (including G.M. Brown, G.R. Robson), brief notes by Wager. Brief notice about 1949 field excursion.	

Expeditions and research

- B.421 Yorkshire Geological Society excursion to Teesdale, 21-23 May 1948, led by Wager.

Correspondence 1947-1949 with colleagues and others on organisation, accommodation, permissions to visit, programme, Wager's report on the meeting.
- B.422 British Association excursion to Alston, Teesdale, August 1949.

Correspondence, proposed schedule.
- B.423 University of Durham excursion to Teesdale and Appleby (Yorkshire), 1950.

Arrangements, accommodation, budgeting.
- B.424, B.425 Correspondence and draft 1926-1930**
- B.424 Correspondence with colleagues 1926-1930, requests for information about proposed Whin Sill work, thanks for published papers.
- B.425 'A note on the nomenclature of rocks produced by metastomatism'.

Manuscript draft, notes and data.
- B.426-B.429 Field notebooks 1926, 1944-1947**
- B.426 Soft-backed notebook 'Dent Dale' July 1926. Few pages used.
- B.427 Soft-backed notebook 'Whin Sill and contacts in Teesdale and Pennine Scarp' September 1926. Notes on 'Cowshill January 1929' inserted on loose pages.

Brief notes at back of book.
- B.428 Exercise book 'Miscellaneous Geological Excursions', 1944-1946. Detailed list of localities (all in Yorkshire) on front and back covers.

Expeditions and research

- B.436 'Rough early notes on Cowshill Sections'.
- B.437-B.440 Three exercise books of descriptions of thin sections of Whin Sill rocks.
- B.437 AWS-DAWS First book.
- B.438 EAWS-GBWS 2nd book.
- B.439 HBWS- 3rd book.
- B.440 'Chlorite Alteration', notes from ring-book binder so inscribed.
Rock analyses, some on specimens at Sedgwick Museum Cambridge.

B.441 Maps

- B.441 Annotated field maps and diagrams of Upper Teesdale and area.
References and miscellaneous geological information.

B.442-B.455 MISCELLANEOUS EXCURSIONS 1919-1958

The material here includes all periods of Wager's activity, from the very early days or localities rarely visited to relatively regular university excursions. Some of the notebooks cover a number of excursions extending over several years.

Of some interest is B.442 which records rock specimens from Trinidad and the West Indies during Wager's year spent there with his father and brother 1919-1920.

B.442-B.449 Notebooks and diaries

B.450-B.455 Papers and correspondence

Expeditions and research

- | B.442-B.449 | Notebooks and diaries | 1919-1958 |
|-------------|---|-----------|
| B.442 | Black notebook, with several intercalated pages relating to later additions to the original descriptions, of 'Rock Sections'. Numbered items run 1-37 from various locations and dates. Numbers 1 and 2 are from the West Indies and dated 'Early 1920', numbers 7 and 28 are from Trinidad 1919. Other items are from Yorkshire, Lake District, Wales, Dartmoor, Alps, Auvergne, Anglesey. Latest dates 1925.

At rear of book, brief notes on crystals. | |
| B.443 | Soft-backed notebook 'Shropshire Christmas 1925'. | |
| B.444 | Handbook on 'The Geology of South Shropshire', interleaved with diagrams etc. by Wager. | |
| B.445 | Soft-backed notebook, 'Dolgelly, Rhoebell Fawr, Bala and Llangollen Districts with C.H.W. [Waddington] March 1927'.

At rear of book, misc. notes on Wales, and 'I.O.M. [Isle of Man] notes from the literature 1930'. | |
| B.446 | Black notebook with many intercalated pages of notes, information, programmes of excursions. Various dates 1946-1955, mainly Yorkshire locations. | |
| B.447 | Small black notebook, 'Rough Field Notes mainly round Oxford', one page dated 1951. Few pages used. | |
| B.448 | Small pocket-size diary labelled on spine and front cover 'Cornwall and B.A. (Glasgow) excursion 1958'. | |
| B.449 | Small exercise book of miscellaneous expeditions and rock specimens numbered in various sequences. Undated, but includes brief notes on 'British Association Glasgow 1928'. | |

Expeditions and research

B.450-B.455	Papers and correspondence	1933-1955
B.450	British Association visit to Charnwood Forest and Mountsorrel during meeting at Leicester, September 1933. Programme of visit and information.	
B.451	University of Reading excursion to Lake District, 31 March - 8 April 1939. Information, notice, participants, accommodation, list of rocks (not by Wager).	
B.452	University of Durham excursion to Mungrisdale Cumberland, 25 June - 2 July 1949. Notice, participants (includes G.M. Brown, Y.M. Anwar), accommodation, arrangements, correspondence.	
B.453	University of Durham excursion to Shropshire, 18-24 April 1950. Information.	
B.454	University of Oxford excursions to Mungrisdale Cumberland and the Northern Lake District, June 1951. Correspondence, accommodation, permissions to visit, participants, notes and information, Wager's 13pp manuscript notes on 'Igneous rocks of north of England'.	
B.455	University of Oxford excursion to the Lake District, 16-23 April 1955. Accommodation, permissions to visit, participants, notes and information, diagrams, map.	

Expeditions and research

B.456-B.474 **ADVICE AND CORRESPONDENCE** **1946-1965**

This is a chronological sequence of correspondence 1946-1965 dealing with expeditions planned by university exploration societies, mountaineering clubs or individuals. Some are brief exchanges, others such as the British North Greenland Expedition (B.461) show a wider involvement by Wager.

The material is essentially requests for advice on the practicalities of expeditions: selection of team members, funding, equipment, choice of sites and routes etc., almost all in the Arctic. Some expedition reports or correspondence on research may be included.

The dates of the entries are those of the correspondence, which may antedate the expedition itself by a year or more.

- B.456 1946.
Cyrenaica; East Greenland.
- B.457 1947.
Peruvian Andes (invitation to Wager to join - declined); Jan Mayen Island.
- B.458 1948.
North-east Greenland; Spitsbergen.
- B.459 1949.
Dronning Maud Land, Antarctica; Nepal; West Greenland.
- B.460 1950.
University of Durham expeditions to Iceland and Norway (reports); British West Greenland Expedition (final plan).
- B.461 1950-1953.
British North Greenland Expedition.

/...

Expeditions and research

- /... This was a major expedition organised and led by J.W.C. Simpson, involving scientific projects and Service training. Wager served on the Steering Committee and later on the Main Committee. The correspondence covers funding and budgeting, recruitment of personnel, scientific projects, report on the geological programme.
- B.462 1950-1951.
Spitsbergen (Oxford and Cambridge Joint Expedition).
Correspondence on funding, planning, personnel, geological results.
- B.463 1951.
Swedish Lapland; Labrador (University of Oxford Expedition).
- B.464 1953.
Himalaya; Spitsbergen (University of Cambridge); University of Oxford).
- B.465 1954.
Spitsbergen; Iceland.
- B.466 1955.
British East Greenland Expedition.
- B.467 1959.
Jan Mayen Island (includes report by A.T.J. Dollar); East Greenland.
- B.468 1960.
Spitsbergen.

Expeditions and research

- B.469 1962.
Kangerdlugssuaq (1963 Scottish East Greenland Expedition).
- B.470 1962-1963.
Proposed Joint Services Expedition to East Greenland.
- B.471 1964.
Angmassalik, East Greenland.
- B.472 1964-1965.
East Greenland (University of Oxford Expedition).
Correspondence on planning, funding.
- B.473 1964-1965.
Schweiserland (1966 Royal Navy Expedition).
Correspondence, plans and comments.
- B.474 1964.
East Greenland (proposed 1966 expedition).
- B.475-B.478 MISCELLANEOUS ROCK CATALOGUES 1938, 1955, 1962, n.d.**
- B.475 'Catalogue of rocks collected in Norway by L.R. Wager in summer 1938'.
Specimens numbered 1-91 from various locations.
- B.476 'Rocks collected during field seasons 1955'.
Specimens of USA rocks from many locations, and several numerations, not
in Wager's hand.

SECTION C

UNIVERSITY OF READING

C.1-C.15

This section records Wager's lectures and teaching at the University of Reading.

Wager was appointed Lecturer in Petrology at the University of Reading in 1929, and remained such until his appointment as Professor of Geology at the University of Durham in 1943 (effective from 1944).

There is very little surviving material to document this relatively long period. As a lecturer, Wager was not involved in Departmental administration, and this was the period of his most important expeditions in 1930-1931, 1932, 1934, 1935-1936, for which the University granted any necessary leave of absence. The outbreak of war in 1939 led to Wager's work with the Air Ministry's Photographic Interpretation Unit from May 1940 until November 1943 when he was released to take up the Durham appointment.

There is a little material on Wager's appointment to the University of Reading in Section A and several records of his field excursions with students in Section B.

University of Reading

- C.1 'Igneous history of I. O. M. [Isle of Man]' with a manuscript note 'to Reading class after visit', n.d. but given in March 1930 after Wager's first field class (*Hargreaves*, p.27).
- Wager was never a confident lecturer. Other pencilled comments read 'Not enough geological detail and reminiscing. Jokes failed. Too slowly delivered. Attempt to modify usual style meant that I never felt natural and comfortable.'
- C.2 Wager's notes and aide-memoires on lecturing techniques and revision.
- C.3 'Lectures I'
- Extensive manuscript draft paginated 1-139, pp.1-77, Crystallography and Optics (first and second year), pp.78-139, Petrology of Igneous Rocks (second year).
- C.4 Lecture on rock-forming minerals, with a manuscript note 'Mineral vein notes with Durham Inter lectures'. Probably given at Reading and used also at Durham (information from E. A. Vincent, 1999).
- C.5 'Inter[mediate] Lectures Reading' (first year).
- Extensive heavily corrected manuscript drafts for a course of sixteen lectures on crystallography.
- C.6 'Intermediate Practical Class I'.
- Two sets of manuscript problems for practical work.
- C.7 'Intermediate Practical I'
- Laboratory requirements for sixteen practicals.
- C.8 'Practical work II'
- Manuscript problems for practical work.

University of Reading

- C.9 'Reading Intermediate Practical'
Manuscript notes for twenty-two practicals.
- C.10 'Skye and general tertiary igneous geology. R. U. 3rd year lecture notes'.
Extensive manuscript notes.
- C.11-C.14 Miscellaneous lectures and notes.
- C.11 'X-rays and the structure of minerals'.
- C.12 'Metamorphism'.
- C.13 'Very simple trigonometry with illustrations drawn from crystals'.
- C.14 Notes for 'Advanced work', essay topics, reading lists etc. 1931
- C.15 Typescript notes for demonstrations 1-23, catalogue of rocks and slices.

SECTION D UNIVERSITY OF DURHAM

D.1–D.29

Wager held the Chair of Geology at the University of Durham from 1944 to 1950.

The surviving material is not extensive. Wager's preparation for the post, including advice taken from others, his own thoughts on aims and course structuring, and the careful training in X-ray crystallography with a view to possible future work are shown at D.1-D.7.

The correspondence at D.8-D.14 is miscellaneous. It includes departmental funding, equipment, requests to work or visit, and the University Exploration Society. There is some shorter scientific correspondence but very little general correspondence on Durham affairs. A substantial proportion of the surviving material dates from 1949-1950, the last years of Wager's time at Durham.

Material relating to Wager's appointment, and to various other applications for chairs during his tenure at Durham, is at A.39-A.43. The regular field excursions, mainly to Teesdale, are documented in Section B.

D.1-D.7	PREPARATION AND ORGANISATION
D.8-D.14	CORRESPONDENCE
D.15-D.28	LECTURES AND TEACHING
D.29	MISCELLANEOUS

University of Durham

D.1-D.7	PREPARATION AND ORGANISATION	1942-1944
D.1	Correspondence and information on the teaching of geology at Durham from A. Holmes (the outgoing Professor) and W. Hopkins, 1943. Includes Durham science lecture list, 1942.	
D.2	Correspondence and timetable of teaching at Bristol from W. F. Whittard, 1944.	
D.3	Wager's ideas on aims and courses, one set beginning 'What are we aiming at?', some dated January, April, June 1944. Various outlines of courses, lecturing technique, assignments for students, teaching and research areas for E.A. Vincent, miscellaneous shorter notes.	
D.4-D.7	Notes and teaching material relating to a Summer School on X-ray crystallography, organised by Cambridge University Board of Extra-Mural Studies and attended by Wager 4-16 September 1944, with a view to installing X-ray diffraction facilities at Durham.	
D.4	Hard-backed notebook of extensive manuscript notes of lectures at Cambridge Summer School.	
D.5	Annotated questions for Demonstrations 1-19. Brief correspondence about Wager's attendance on the course is included here.	
D.6	Wager's notes, diagrams, graphs for Demonstrations 1-18.	
D.7	Manuscript notes pp.1-22. Annotated teaching material and diagrams for Demonstrations.	

University of Durham

D.8-D.14 CORRESPONDENCE 1948-1959

- D.8 Equipment: geological hammers, maps. 1948-1950.
- D.9 Applications by Indian students to work at Durham, 1949.
- D.10 Funding from Shell Petroleum Company for students, expeditions. 1950.
- D.11 Shorter departmental correspondence, 1948-1950.
- D.12 Shorter scientific correspondence. Includes offprints, information, specimens and samples sent or received, some with news of research in progress. 1945-1950.

See also D.29.
- D.13 University of Durham Exploration Society.

Papers and correspondence mainly with G.H.J. Daysh (Professor of Geography at Newcastle) on proposals to form a society, expedition plans and reports, Wager's brief note for speech at a meeting or dinner of the club, February 1948-June 1950.
- D.14 Shorter continuing correspondence, with the Department of Geology and with former Durham students, 1948-1959. Includes annual Departmental report for 1949-1950.

D.15-D.28 LECTURES AND TEACHING

- D.15 'Cadets'

Miscellaneous drafts and notes. No date or further information is given, but this may have been one of the RAF Cadet courses attended by G. M. Brown which determined him to read geology at Durham after demobilisation (see L.8 and *Hargreaves* p.91). See also G.53.

University of Durham

- D.16-D.18 'Structural geology'
Course for second-year Pass and first-year Honours students.
- D.16 Booklist, course outline, maps.
- D.17 Drafts for titled lectures: Tectonics of the Alps; North American Cordillera; Mapping, Tilting and Folding; Fracture of the rocks.
- D.18 'Structural geology'
Drafts and diagrams, heavily revised.
- D.19 'Constitution of the Earth'
Extensive notes and drafts, some titled, probably for second or third year work.
- D.20 Outlines for courses on Vulcanology (6 lectures), Earthquakes and Seismology (8 lectures) to be given by F. H. Stewart.
- D.21-D.23 Geological mapping.
- D.21 Wager's notes, drafts, annotated teaching maps and diagrams.
- D.22 Notes, annotated teaching maps and diagrams by E. A. Vincent.
- D.23 Geological maps (annotated).
- D.24 Shorter manuscript notes on supervisions, essay topics, programmes and schedules.

SECTION E

UNIVERSITY OF OXFORD

E.1-E.73

Wager was appointed to the Professorship of Geology at the University of Oxford in succession to J.A. Douglas, his election being announced on 26 April 1950. He remained there until his death in 1965.

Wager's Chair carried with it a Fellowship at University College, but no material survives on College affairs, and there are few records of his involvement in general Oxford University matters; see E.10-E.15.

The material in this section therefore essentially concerns the Department of Geology and Mineralogy, its organisation and funding, research and teaching. Wager's determination to enhance the status of geology at Oxford can be seen by his drive to have it recognised as a school and entrance subject (E.1, E.2). Much of the petrological research was a continuation of the geochemical analysis of East Greenland and other igneous rocks (recorded in section B) now pursued with newer techniques and equipment and sometimes with outside collaboration such as that with Departments of the United Kingdom Atomic Energy Establishment (UKAEA) at Harwell. A new development was geochronology and the establishment of the Geological Age and Isotope Research Group (GAIR) (E.18-E.38).

The lectures and syllabuses at E.39-E.73 include relatively standard topics in university geological studies, but also the new graduate course in Geochemistry, and the various 'service' courses for non-specialists. The careful notes taken by Wager at lectures by visiting scientists and short-term members of departmental staff (E.63-E.69) are of interest.

For fuller information see E. A. Vincent: *Geology and Mineralogy at Oxford 1860-1986. History and Reminiscence* 1994. Hereafter referred to in the text as *Vincent*.

E.1-E.9	DEPARTMENT OF GEOLOGY AND MINERALOGY
E.10-E.15	COMMITTEES AND SOCIETIES
E.16-E.38	RESEARCH
E.39-E.73	LECTURES AND TEACHING

University of Oxford

E.1-E.9	DEPARTMENT OF GEOLOGY AND MINERALOGY	1950-1965
E.1-E.3	General, 1951-1960.	
E.1	Correspondence with Oxford and Cambridge Schools Examination Board and with colleagues, on the examination of geology at A and S level in schools. 1956-1959	
E.2	Correspondence on the inclusion of geology among subjects for college scholarship examinations at Oxford. 1956-1960	
E.3	Appointments in Department 1951-1960.	
E.4-E.7	Grants and Funding, 1954-1965. Correspondence and papers on grants, scholarships or fellowships, some with information on research in hand or projected.	
E.4	Imperial Chemical Industries (ICI) 1954-1956.	
E.5	Shell Petroleum Company, 1955-1961.	
E.6	British Petroleum Company, 1960, 1963.	
E.7	Nature Conservancy, 1955-1965. Grants for research on Rhum and St Kilda and general Nature Conservancy affairs. Includes research report on geological investigations on Rhum, with comments by E.B. Bailey.	
E.8	Shorter correspondence on requests to visit or work in Department, thanks for visits etc., 1956-1964.	
E.9	Shorter correspondence on possible careers for students in the Colonial Service and elsewhere, various dates 1950-1965.	

University of Oxford

E.10-E.15	COMMITTEES AND SOCIETIES	1954-1965
E.10	Boise Fund, 1957-1964. The Boise Bequest to the University was for anthropological research and the study of early migration. Wager was an administrator ex officio as Professor of Geology, the others at that time being W.E. Le Gros Clark (Professor of Anatomy) and J.S. Weiner (Reader in Physical Anthropology). Correspondence, applications, recommendations for grants.	
E.11	Oxford Geology Group, 1956-1960. Wager was President of the Group, which held its meetings in the Department. Brief correspondence on the formation and meetings of the Group.	
E.12-E.15	Oxford University Exploration Club and Expedition Council, 1954-1965. Wager was President from 1960 to 1963 and thereafter a Vice-President.	
E.12	Correspondence, agendas and minutes, funding, recommendations on expeditions, 1954-1960.	
E.13	Correspondence, agendas and minutes, revised constitution, membership of Council, 1961-1965.	
E.14	Council agendas and minutes, 1961-1965.	
E.15	Correspondence with organisers of Oxford expeditions, or planned expeditions, including plans, recommendations, thanks for advice, funding requests, 1955-1963.	

University of Oxford

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|-------------------|--|--|
| E.16-E.38 | RESEARCH | 1951-1965 |
| | E.16, E.17 | Trace Elements |
| | E.18-E.38 | Geological Age and Isotope Research (GAIR) |
| E.16, E.17 | Trace Elements | 1951-1965 |
| | This work began in collaboration with R. L. Mitchell, resulting in their major joint paper in 1951 (<i>Geochim. et Cosmochim. Acta</i> , 1) See F.29-F.38. | |
| E.16 | Correspondence on the Franz Electro-magnetic separator and arrangements to obtain one for mineral separation work, with manufacturers, colleagues and UKAEA Harwell. 1951-1952 | |
| E.17 | Correspondence and papers on collaboration work with UKAEA Harwell on radioactive techniques for trace elements analysis, 1954-1965.

The correspondence is mainly exchanged with A.A. Smales (Analytical Chemistry Group), L.D. Muller and S.W.F. Patching (Mineral Group) at Harwell, and includes arrangements for visits and exchange of specimens, results and reports, draft publication etc. | |
| E.18-E.38 | Geological age and isotope research (GAIR) | 1954-1965 |
| | This was one of Wager's most important innovations in the Oxford Department. See <i>Vincent</i> pp. 92-98 and <i>passim</i> for a fuller discussion. The folders below are those which survive among Wager's papers and do not constitute a complete account. | |
| E.18 | Miscellaneous manuscript notes by Wager, on the chronology of 'GAIR in Oxford' 1954-1958, budget, organisation of research areas among personnel etc. Also included is a manuscript draft by S. E. Moorbath for GAIR Annual Report 1956-1957, which includes an outline history. | |
| E.19 | Correspondence and papers with Colonial (later Overseas) Geological Surveys, on geochronological work at Oxford, support for GAIR, recruitment and staffing, equipment, specimens for testing etc. The correspondence is mainly conducted with K. A. Davies (Deputy Director, Overseas Geological Surveys), but also includes E. A. Vincent and other GAIR members, and Oxford officials on acceptance of grant. | |

University of Oxford

- E.20 Shorter correspondence on funding, from UKAEA 1957, Department of Scientific and Industrial Research 1962, 1965.
- E.21 Visit by invitation to see the work of GAIR, 27 February 1959.
Correspondence with those invited, notes on methods of work.
- E.22 Correspondence on mass spectrometer for GAIR, 1960-1965.
- E.23, E.24 Staffing and recruitment for GAIR. Requests to work, advertisements, applications, correspondence with colleagues.
- E.23 1960-1965.
- E.24 1963-1964.
Wager's named folders of applicants. Correspondence from S. E. Moorbath and other GAIR staff.
- E.25 Agendas and Wager's manuscript notes for weekly meetings of GAIR Group, 1960-1964. Not all dated.
- E.26 Notes and correspondence from GAIR staff on the organisation and running of the laboratory, and of the Geochemistry Diploma Course.
- E.27 Correspondence, reports on research and on visits to other age-isotope laboratories by E. I. Hamilton (a BP Fellow). Includes letter 1963 on unsatisfactory fume-cupboards in new departmental building (see *Vincent*, p.104).
- E.28-E.30 Correspondence and requests for age determinations to be carried out by GAIR Group, 1958-1964.
- E.28 1958-1961.

University of Oxford

- E.29 1962-1963.
- E.30 1964.
- E.31, E.32 GAIR reports on work done.
- E.31 Age measurement summary, 1960-1962.
- E.32 Annual reports, 1962, 1964, 1965.
- E.33-E.38 General correspondence and papers on GAIR affairs: organisation, specimens sent or requested, results, publications, visits, 1955-1963.
- The correspondence is particularly full for 1959 when Wager was on sabbatical leave and was kept informed of events by colleagues, mainly E. A. Vincent, but also M. H. Dodson, E. I. Hamilton, B. J. Giletti, L. Kulp, R. St. J. Lambert, S. E. Moorbath.
- E.33 1955-1958.
- E.34 1959.
- This includes research results and drafts for papers as well as correspondence from several staff or visiting members of GAIR Group. The period coincides with Wager's absence on sabbatical leave and also the publication of a collaborative paper by K. I. Mayne (Clarendon Laboratory, Oxford), R. St. J. Lambert and D. York (GAIR) on 'The Geological time-scale' *Nature*, **183** (1959), some of whose results were questioned (*Vincent*, pp. 94-95). General news of laboratory activities and excursions is also included.
- E.35 Notes, data, results etc. related to geochronology work, by Wager and by GAIR members, 1958, 1959 and n.d.
- E.36 1960.
- Includes some continuing correspondence on the 1959 age-determination paper.

University of Oxford

E.37 1961-1963.

E.38 Other correspondence requesting or arranging visits to GAIR Group, 1960-1961.

E.39-E.73 LECTURES AND TEACHING 1950s, 1960s

The lecture material is all Wager's manuscript, sometimes paginated or with a title and including drawings or diagrams.

The material for classwork or practicals is usually duplicated.

- E.39-E.42 Sedimentary Rocks (first-year course)
- E.43-E.48 Igneous activity (second-year course)
- E.49-E.54 Igneous Petrogenesis (third-year course)
- E.55-E.56 Diploma in geochemistry
- E.57-E.62 Geology for biologists
- E.63-E.69 Departmental lectures
- E.70-E.73 Teaching material

E.39-E.42 Sedimentary Rocks (first-year course)

E.39 Bibliography, outline draft of course of 16 lectures over two terms, list of practicals.

E.40 'Classification of sedimentary rocks'.

E.41 'Sedimentary rocks'. Manuscript drafts for lectures on various topics.

E.42 'Practical sheets - sedimentary rocks'. Includes 'Important rock-forming minerals', Demonstrations I-XIV, location and description of specimens used in teaching.

University of Oxford

E.43-E.48 Igneous activity (second-year course)

E.43 'Review of Igneous History of G. B.'

E.44 'Igneous activity. Intrusion'.

E.45 'Igneous activity. Volcanoes'.

E.46 'Igneous activity-Volcanic'.
Worksheets and demonstrations.

E.47 'Igneous activity. Miscellaneous notes and papers'.

E.48 Igneous activity. Manuscript and typescript notes and worksheets, lantern
slides and lecture specimens, tabulated classification etc.

E.49-E.54 Igneous Petrogenesis (third-year course)

E.49 'Skaergaard Lectures 3rd year'.
Manuscript drafts, typescript teaching material, list of thin sections, practical
problems, data.

E.50 'Petrogenesis (1) Crystallisation of melts'.

E.51 'Petrogenesis (2) Differentiation by crystal fractionation'.

E.52 'Petrogenesis (3) Other petrogenetic processes involving magma'.

E.53 'Petrogenesis (4) Igneous rock associations. Source of magma. Rock
associations and their tectonic setting'.

University of Oxford

- E.54 Miscellaneous drafts and notes for lectures and demonstrations on petrogenesis.
- E.55, E.56 Diploma in geochemistry 1961–1965**
- This was a taught postgraduate course instituted in Michaelmas Term 1961; it was re-designated as a M.Sc. degree from 1971 and discontinued from 1980 (*Vincent* pp. 112-113, 167).
- Wager regularly gave the introductory lecture on the history of the subject and shared a course on petrogenesis with G. M. Brown.
- E.55 Schedules of lectures and lecturers 1961-1965.
- Reading list, outline and drafts for Wager's introductory lecture.
- E.56 Miscellaneous worksheets, notes and drafts for lectures on geochemistry.
- E.57-E.62 Geology for biologists 1963**
- This was part of a new preliminary (first-year) examination introduced in Michaelmas Term 1963. Wager gave the introductory lectures.
- E.57 Departmental meetings, plans, timetables and lecturing assignments for the new course.
- E.58 'Introduction to Geology I. The scope of geology'.
- E.59 'Introduction to Geology II. The constitution of the earth.'
- E.60 'Introduction to Geology III. History of the earth'.
- E.61 Teaching material for practicals, demonstrations, information.

University of Oxford

E.62 Worksheets, demonstrations, reading lists for classes on regional petrology, igneous activity, petrogenesis, rock-forming minerals (by E. A. Vincent).

E.63-E.69 Departmental lectures

These are Wager's notes, often extensive, on lectures given by departmental staff or by visiting scientists.

E.63 L. H. Ahrens (Reader in Mineralogy 1953-1956): Geochemistry (12 lectures).

E.64 S. R. Taylor (Demonstrator 1955-1958): Methods of analysis.

E.65 H. D. Holland (sabbatical leave from Princeton 1956-1957): Geochemistry of metallic ore deposits.

E.66 H. D. Holland and P. Bartholomé (Demonstrator 1956-1957): Application of Thermodynamics to geological problems.

E.67 H.C. Urey: Cosmochemistry.

E.68 K. S. Heier (Demonstrator 1957-1958): Geology of Norway (4 lectures).

E.69 J. L. Kulp (sabbatical leave from Columbia 1958-1959): Some problems in geochemistry and geochronology (5 lectures).

E.70-E.73 Teaching material

E.70 Hard-backed exercise book 'Lantern slides accession series, November 1950.'

Slides listed 1-510, in various hands. Slides 1-71 were brought from Durham in 1950. Slides 1-124 are Geological Survey slides with typescript descriptions.

/...

University of Oxford

- /... A little correspondence requesting Geological Survey slides is tucked into front of book, 1950.
- E.71 Large ledger-type ring-backed book 'Lantern slides Mount Everest, East Greenland, Tertiary Volcanic Districts, Atlantic and Miscellaneous'.

Lists compiled at various dates and in various hands, including slides from Wager's expeditions and slides required for undergraduate courses.

See Section M for slides used in Oxford lectures.
- E.72 Small hard-backed notebook with many intercalated notes and pages.

Laboratory assistant's notes of lecture requirements: slides, rock specimens, maps, books laid out on lecture bench, diagrams on blackboard or wall for each lecture week by week, mainly by Wager, but also E. A. Vincent, R. L. Oliver, G. M. Brown and D. S. Weedon. 1950-1956.
- E.73 Small hard-backed notebook.

Laboratory assistant's notes of lecture requirements: slides, rock specimens, materials on lecture bench, maps on wall for each lecture week by week. Some by Wager, but mainly by G. M. Brown, 1956-1962.

SECTION F RESEARCH TOPICS

F.1-F.39

This material, which may include research notes and data, drafts for lectures, papers and publications, and correspondence, was kept in separate named folders by Wager, although some overlap may occur with other sections of the collection.

The biotite material may reasonably be considered an entity, since it constitutes a research episode that did not develop. It did, however, inaugurate Wager's important collaboration with R. L. Mitchell at the Macaulay Institute for Soil Research at Aberdeen, beginning in 1943 and continuing for a decade of research and publications on trace elements in the rocks of the Skaergaard intrusion, East Greenland. The continuation of this work at Oxford University is to be found in the research folders of section B, at E.16, E.17, or in the accompanying material for Wager's lectures and publications.

F.1-F.13	BIOTITE
F.14-F.36	TRACE ELEMENTS
F.39	MISCELLANEOUS

Research topics

F.1-F.13 **BIOTITE** **ca 1926-1948**

Wager's first notes on biotite and its properties possibly date from his early work at the University of Cambridge (F.1), but his main interest in its potential as a source of potash for agricultural use dates from the beginning of the Second World War. He collected information and attempted to arouse wider interest in the relevance of the project in view of likely wartime shortages, particularly at the Macaulay Institute for Soil Research at Aberdeen. A meeting was held there in October 1939 and a joint research programme initiated between Wager at the University of Reading and members of the Institute's staff. By May 1940, however, it seemed clear that the potash content extracted from rocks would not be economic taking into account the quantities required and the costs of crushing and extraction. Field experiments continued at the Institute, but there was no large-scale development.

F.1-F.8 Correspondence and papers

F.9, F.10 Research notes

F.11-F.13 Lecture and publication

F.1-F.8 **Correspondence and papers** **ca 1926-1948**

F.1 'Helm Gill Dikes'

Manuscript list of specimens collected, coded 'H.G.' and of analyses carried out. Specimen 2a H.G. has a note 'collected on first visit in June 1926'.

F.2 Correspondence and early plans for biotite work, August 1939 - May 1940.

Includes correspondence from V. M. Goldschmidt and Wager's manuscript translation of P. Solberg's report on experiments in Norway.

F.3 Minutes of the meeting at Macaulay Institute, Aberdeen, on 'Biotite as a source of potash in agriculture', with background papers and research plans, 2 October 1939

F.4 Catalogue of rocks collected in north east Scotland and at Shap, Cumbria, after the meeting at Aberdeen as part of biotite research. Manuscript and typescript copies. October 1939.

Research topics

F.12, F.13 'A stage in the decomposition of biotite from the Shap granite', paper offered to *Geological Magazine* 1944, and published in *Proc. Yorks. Geol. Soc.*, **25**, 1945.

F.12 Manuscript drafts.

F.13 Typescript drafts, letters to editors 1944, 1945.

F.14-F.38 TRACE ELEMENTS 1940-1960

Wager's interest in geochemistry and the analysis of the Skaergaard rocks had begun in the 1930s but came to the fore in the early 1940s with his collaboration with R. L. Mitchell of the Macaulay Institute for Soil Research at Aberdeen, who, initially, was responsible for the trace element analysis. The work produced a series of lectures and papers during the late 1940s and a major paper which appeared in the first number of the new journal *Geochimica et Cosmochimica Acta* in 1951.

After Wager's move to Oxford University, trace determination remained an important component of the research in the Department, undertaken mainly in collaboration with E. A. Vincent, A. A. Smales and others. Much of this later work is documented in Section B, and at E.16, E.17, to which reference should be made.

F.14-F.20 Correspondence and papers

F.21-F.28 Research notes and data

F.29-F.38 Lectures and publications

F.14-F.20 Correspondence and papers 1943-1960

F.14, F.15 Correspondence with R. L. Mitchell, 1943-1958.

Frequent exchanges including data and results, ideas for new or continuing work; letters from other colleagues may be included.

F.14 September 1943 - May 1948.

Wager's letter of 27 October refers to his paper on Shap biotite and continues:

/...

Research topics

- /... 'Your suggestion that you might have time for more determinations on the Skaergaard rocks has inspired me to begin getting out the rocks and considering the separation of the minerals. It would be grand if we could get on with it.' Plans for future work and schedules for despatch of rock specimens are included.
- F.15 March 1949 - May 1950, 1958.

Includes discussion of the major paper and place of publication; see letters May, July 1949 with *Medd. om. Grøn*. The paper appeared in *Geochimica et Cosmochimica Acta* 1, 1951.

Correspondence October 1958 is from Mitchell returning rock samples to Wager for him to carry out further work on Skaergaard rocks at Oxford.
- F.16 Correspondence with W. A. Deer, 1949.
- F.17 Correspondence with H. Neumann, February - July 1949, 1950.
- F.18 Correspondence, data, photomicrographs from R. Phillips, 1950-1951.
- F.19 Shorter correspondence from colleagues, 1943-1946.
- F.20 Thanks for copies of published paper and continuing work on Skaergaard trace elements, 1951-1960.
- F.21-F.28 Research notes and data 1940-1949**

Bundles of material kept together with titles or rough descriptions by Wager, retained here with dates or additional information when ascertainable.
- F.21 'Data on trace elements', 1940-1947.
- F.22 'Notes on Plag[ioclase]'. One page dated 1949.

Research topics

- F.23 'Notes on inclusions and exsolution'. Includes correspondence with A. G. McGregor 1949.
- F.24 'Odd notes - early'. Extensive bundle of notes, suggestions for research programme, questions etc for R.L. Mitchell and WAD (W.A. Deer) drafts.
- F.25 'Odd notes - later'. Queries and ideas, 1p. dated 1949.
- F.26 'Conversion factors. Periodic table'.
- F.27 'Trace - early notes. Abstracts'. Mainly notes on the literature: trace elements, geochemistry, radioactivity.
- F.28 Results and correspondence from colleagues I. D. Muir, E. A. Vincent, 1949.
- F.29-F.38 Lectures and publications 1945-ca 1953**
- F.29 (With R. L. Mitchell) 'Distribution of vanadium, chromium, cobalt and nickel in eruptive rocks', *Nature, Lond.* **156**, 18 August 1945.

Manuscript draft, correspondence with Mitchell and with Editor, *Nature*, on a subsequent communication submitted by P.H. Lundegardh.
- F.30-F.32 'Distribution of trace elements in a layered intrusion and some of the controlling factors', Wager's contribution to a Geochemical Discussion on 'The distribution of trace elements in minerals and rocks' at the Royal Astronomical Society, London, 28 February 1947.

An account of the meeting appeared in *The Observatory Magazine* 1947. Not in Bibliography.
- F.30 Correspondence, arrangements for meeting and publication, 1946-1947.
- F.31 Drafts and data.

Research topics

- F.32 'Manuscript used at lecture'.
- F.33-F.35 (With R. L. Mitchell) 'The distribution of Cr, V, Ni, Co and Cu during the fractional crystallization of a basic magma'. *Geol. Congr. 18th Session, Great Britain, 1948.*
- F.33 Correspondence, mainly with editors, about publication of the paper, additions and alterations by Wager, his reply in discussion to question by C. E. Tilley etc. 1948-1949.
- F.34 Manuscript drafts for paper and tables.
- F.35 Drafts for abstract: 'Early draft of extended abstract', 'First abstract (twice too long)', 'Final abstract (but too late for publication)'.
- F.36, F.37 (With R.L. Mitchell) 'The distribution of trace elements during strong fractionation of basic magma – a further study of the Skaergaard intrusion, East Greenland'. *Geochimica et Cosmochimica Acta*, **1**, 1951.
- F.36 Multiple drafts for Section XI, under various titles.
- F.37 Correspondence with publishers, additions, corrections, proofs.
- F.38 'Trace element composition of Skye anagranites with comparisons by L. R. Wager and R. L. Mitchell'.

Summary, typescript and manuscript draft, n.d. but *ca* 1953. Not published.
- F.39 MISCELLANEOUS 1945**
- F.39 'Notes at Skirmett [Wager's house near Reading] 1944'.

Manuscript notes, thoughts on the peneplanation and uplift of Norwegian Caledonides.

SECTION G LECTURES, SPEECHES AND ADDRESSES

G.1-G.89

This section represents Wager's surviving lectures and papers given by invitation from schooldays onwards. The material reflects all aspects of Wager's career although his professional teaching lectures are in sections C, D, and E.

Although Wager did not find lecturing easy, nor was his speaking style always accessible, his chosen life imposed the frequent obligation to give public addresses. As a scientist, the dissemination of information and research progress by speech as well as in written papers was acknowledged by him even as a schoolboy and undergraduate, and later continuously maintained through the medium of conference and visits. The scientific lectures trace the development of his interests in structural geology, layered intrusions, geochemistry and geochronology.

In Wager's case there was the additional dimension of the great public interest in his achievements as mountaineer and explorer. There was always pressure to give personal accounts to non-professional audiences of the expeditions to Greenland and of the 1933 Mount Everest expedition, as well as the technical geological lectures for scientific societies. In the case of the Everest expedition, indeed, public lecturing by its members was a recognised obligation to help the funds of the sponsoring organisations. Some of Wager's lectures on Greenland and Everest remain with the relevant accompanying material in Section B.

The material here, which is presented chronologically as far as possible, is principally drafts, chiefly in pencil or ink, more rarely in typescript. All the drafts bear numerous additions, deletions or corrections. Lists of slides, photographs or rock specimens to be used in the lecture are often included and occasionally there is brief correspondence on arrangements.

Wager's own titles have been reproduced in the catalogue entries.

Lectures and papers

- G.1 'Crystallography or the study of crystals', with a later manuscript note 'Lecture at H. B.' in an exercise book of Hebden Bridge United District Secondary School.
- Wager attended this school, where his father was Headmaster, from 1914 to 1920, when he left for Leeds Grammar School. The lecture may have been given in his last term at Hebden Bridge, 1920.
- G.2 Lecture to Leeds Grammar School Science Society, no title or date, on Wager's year in the West Indies, 1919-1920.
- 20pp with list of 'Specimens'.
- G.3 'Crystallography', with a later manuscript note 'Lecture to Science Society at L. G. S. [Leeds Grammar School] about 1922'.
- 17pp manuscript, last page or pages missing.
- G.4, G.5 Essays at Cambridge University for Supervisions by Gertrude Elles, n.d. 1923-1926.
- G.4 'Diastrophism versus Palaeontology as a basis of correlation', with comments by Elles.
- G.5 'Isostasy and mountain building'.
- G.6 'The C.U.M.C. [Cambridge University Mountaineering Club] meet in the Alps 1925', Pembroke College, Cambridge, n.d.
- G.7 'Old Age and Extinction' with a later manuscript note 'To The Martlets [an essay society] at Pembroke probably 1925 or 1926'.
- G.8 'The Mechanism of replacement as illustrated by metasomatism of the Whin Sill [to Cambridge Philosophical Society May 1926]'.
- G.9 'The glaciation of Britain' with a later manuscript note '? to Pembroke Coll. Sc. Soc.' Given on 5 February 1925. See A.23.

Lectures and papers

- G.10 'Jointing in the mountain limestones of Craven. To the Sedgwick Club [Cambridge] January 1928'.
The Club programme gives the date as 5 June. See A.24.
- G.11 'To the P. C. S. S. [Pembroke College Science Society] Nov 1928'. No title, but on 'the relation of geology to the more fundamental sciences'.
The Society's programme gives the title as 'Application of physics and chemistry to geology'. See A.23.
- G.12 'Sedimentation of the Carboniferous of Craven. To Sedgwick Club' [Cambridge] n.d., probably 1928.
- G.13 Letter to J. M. Scott, January 1932, incorporating a note on East Greenland rocks, for publication in 'a Tadpole journal'.
- G.14 'Scenery of the Angmagssalik district of East Greenland. To the Reading Geology Club 25 February 1932'.
- G.15 'The Angmagssalik Eskimo. To Kosmos [students' scientific society at University of Reading] 4 March 1932'.
- G.16 'Journey across the Greenland Ice Cap to Mt. Forel. To St. Bartholomew's Hospital Alpine Club, May 1932'.
- G.17 'Geological work in E. Greenland during the B.A.A.R.E. [British Arctic Air Route Expedition] 1930-31. To Geological Society 8 June 1932'.
- G.18 'Brief report of geology for the Captain [Mikkelsen] 21 September 1932'.
- G.19 'The Greenland Ice Cap. To the Geographical Association Durham 9 December 1932'.

Lectures and papers

- G.20 'To Pats J. C. R. 1932'. 'Pats' is St. Patrick's Hall of Residence, University of Reading.
- G.21-G.23 Untitled lectures or talks on Greenland, probably 1932.
- G.21 Mainly on geological features.
- G.22 On Eskimo.
- G.23 'Notes for an account of Forel Journey (never published)'. The account is incomplete, covering only the first attempt on the mountain in March 1931, not the second attempt in May 1931.
- G.24 'A note on the form and age of the Greenland Ice Cap'.
Manuscript and typescript draft, later published in *Geol. Mag.* **70**, 1933.
- G.25, G.26 Two talks given at Royal Geographical Society, 6 November 1933.
- G.25 Untitled, on Mount Everest expedition. Includes correspondence.
- G.26 'Everest Film', introduction and commentary on P. Wyn Harris's film of Everest expedition.
- G.27 'To G. S. [Geological Society] 8 November 1933', on Everest expedition. Draft, manuscript list of specimens.
See also B.263.
- G.28 'Mount Everest Expedition 1933', lecture to Royal Danish Geographical Society, 9 January 1934.
Manuscript, correspondence and arrangements.

Lectures and papers

- G.29 'Public Lecture at Reading Feb. 2 1934 Approx. same to Ditchling [League of Nations Union] and Marlborough School'.

On Everest.

Includes correspondence.
- G.30 'To Kosmos [Reading University Student Scientific Society] February 1934. Everest'.
- G.31 'To the Reading University Mountaineering Club February 1934. Everest Expedition 1933'.

List of photographs/slides only.
- G.32 'To Imperial College of Science [London] Mountaineering Club', ?early 1934.

Introductory pages only.
- G.33 'Mount Everest and the Eastern Himalaya. To the Sedgwick Club [Cambridge] 6 Feb 1934. Also to G. A. [Geologists' Association London] May 1934'.
- G.34 'Chumunko, an episode of the 1933 Mount Everest Expedition. Cambridge Mountaineering', n.d. probably 1934.
- G.35 '1935-6 Expedition to Greenland - general. To Cambridge Natural History Society November 1936'.
- G.36 'To L. G. S. [Leeds Grammar School] Everest', n.d. probably 1936.

Brief notes.
- G.37 'Kosmos [Reading University] A year of scientific work among the high mountains of East Greenland 19 February 1937'.

Brief notes.

Lectures and papers

- G.38 'To the Pasteur Club. Side-lines of an Arctic Expedition. Feb. 22 1937'.
On diet of various Arctic expeditions, and Eskimo diet.
- G.39 'To Reading Geology Club. March 2 1937'.
- G.40 'The Kangerdlugssuaq Region of East Greenland. To Royal Geographical Society 24 May 1937'.
- G.41 'Lecture to Geol. Ass [Geologists' Association] June 4 1937'.
On the scenery of Kangerdlugssuaq.
- G.42 'Lecture to Geol. Soc. 23 June 1937'.
On 1935-1936 expedition.
- G.43 'To Greenough Club U. C. [University College London] November 1937.
The ice cap and scenery of East Greenland'.
- G.44 'Mount Everest', script for a BBC radio programme compiled by Michael Spender and broadcast 2 June 1938.
Wager's contribution is included on separate sheets.
- G.45 'For BBC German Talks. Summer 1939'.
Draft for general talk on Himalayan mountaineering.
- G.46 'To Geol. and Min. Section of Cambridge Natural History Society 24 November 1939'.
On Greenland.
With a manuscript note 'Much too long – took 1 hour 10 minutes even when very rushed'.

Lectures and papers

- G.47 'Everest 1933. Lecture at Medmenham. About January 1942'.
Medmenham was the site of the RAF Photographic Interpretation Unit in which Wager served, near Henley-on-Thames.
- G.48 'Mount Everest 1933. To Medmenham December 1943'.
- G.49 'A Mount Everest Expedition, lecture to Durham Joint Geographical Societies 28 April 1944'.
Slide list only.
- G.50-G.52 'The origin of the North Atlantic Ocean', Wager's Inaugural Lecture at the University of Durham, 8 November 1944.
- G.50 Manuscript and typescript draft, very heavily corrected, 21 pp.
- G.51 'Jottings of titles for Inaugural'.
Miscellaneous manuscript drafts of material not used in lecture.
- G.52 Early ideas and drafts.
'Atlantis' with a note 'Tried May 1944', 'Scientific work and expeditions', with a note 'Inaugural tried July 1944'.
'Ancient vulcanicity of Greenland' with a note 'tried Sept. 1944'.
- G.53 'Arun and Tista as an example of geological action of rivers. To cadets – an old lecture', ca 1944-1945. See also D.15.
- G.54 'Conditions on the edge of the Greenland Ice Sheet'. Lecture given to 'Newcastle Geographic Club November 1945' and 'Weardale Naturalists December 1945'.
Accompanying correspondence for the Weardale lecture gives the date as 12 December 1944.

Lectures and papers

- G.55 'A scientific expedition to East Greenland', lecture to Darlington and Teesdale Naturalists' Field Club, 26 January 1946.
- G.56 'The geology of the Eastern Himalaya' public lecture for Yorkshire Geological Society, Leeds, 2 February 1949.

With correspondence; Wager was obliged to cancel the lecture because of illness.
- G.57 'Mount Everest Expedition 1933', lecture to Newcastle Photographic Society, 11 February 1946.

With a little correspondence.
- G.58 Lecture to Bishop Auckland Geographical Association, 13 February 1946.

On Everest.
- G.59 'Some scientific side-lines of the 1933 Mount Everest Expedition'. To Newcastle [King's College] Naturalists' Society 3 February 1947.
- G.60 'The high mountains of East Greenland and their origin. To Northumberland and Durham Natural History Society, 13 February 1947'.
- G.61 'The mountains of East Greenland and their origin', lecture to Royal Philosophical Society of Glasgow, 12 March 1947.

With a manuscript note 'This tried to combine expedition and geology and not very satisfactory'.
- G.62 'High Mountains in East Greenland', lecture to the Cairngorm Club London, 22 November 1947.

With a manuscript note 'rather diffuse'.
- G.63 'The structure of East Greenland and the North Atlantic basin. To Durham University Philosophical Society', n.d. but probably 1947 and containing material for more than one lecture on the subject.

Lectures and papers

- G.64 'Exploration in Greenland. Durham Colleges Exploration Club 1 March 1949'.
- G.65 'Exploration in Greenland. King's College [Newcastle] Exploration Club 25 November 1949'.
- G.66 'Introducing BAARE Film. Dec. 1949'. No location given.
- G.67 'Mount Everest 1933. To O. U. [Oxford University] Mountaineering Club, March 1950'.
- G.68 'Geology on the 1933 Mount Everest Expedition. To O. U. Geological Society October 1950'.
- G.69 'A Greenland Expedition. To Bootham School [York] September 1951'.
- G.70, G.71 Lectures in Copenhagen, Denmark and Oslo, Norway, November 1952.
Wager gave three lectures under the general title of 'Layered intrusions and differentiation of basic magma':
1. Layered intrusions in Greenland, the Hebrides and South Africa.
 2. The mechanism of layered intrusions.
 3. Major and trace elements during the differentiation of basic magmas.
- See also H.13 for material on published version of the lectures.
- G.70 Correspondence with friends and colleagues, including other lecture invitations Wager was not able to take up on this occasion.
- G.71 Notes, drafts, slide lists for lectures.
- G.72 'Layered intrusions, mainly the Skaergaard, Lecture in Manchester [25] February 1953'.
With a manuscript note 'Just before EGGE'.

Lectures and papers

- G.73 'E. G. G. E. [East Greenland Geological Expedition] to O. U. Geological Society, November 1953'.
- G.74 'Scientific foot-notes to the Mount Everest story. To Ashmolean Natural History Society [Oxford] December 1953'.
- With a manuscript note 'Difficult to do and too long...'.
Draft, slide list.
- G.75 'Skaergaard intrusion', lecture to Geological Society, Keele University, 8 March 1954.
- Brief correspondence, notes, slide list.
- G.76 'Layered intrusions', the A. K. Wells lecture to the Lyell Club, King's College, London, 7 December 1956.
- Brief correspondence, notes, draft with manuscript note '65 minutes rushing last half dozen slides', slide list.
- G.77 'The behaviour of sulphur during fractionation of basic magma', collaborative paper with E. A. Vincent and A. A. Smales, given at symposium in Paris, France, July 1957.
- Abstract, notes, tables.
- G.78 'Crystal accumulation and the origin of igneous rocks', lecture to Edinburgh University Geological Society, 7 May 1957.
- Brief correspondence, notes, slide list.
- G.79 'The make up and mechanism of formation of layered rock', lecture at Lamont Laboratory, Columbia, and Geophysical Laboratory, Princeton, USA, September 1957.
- Notes, draft, slide list.

Lectures and papers

- G.80 'Geology of Mount Everest region', lecture to Oxford University Geological Society 27 February 1958'.

Notes, list of rock specimens used.
- G.81 'Crystal accumulation and layered intrusions. To Geological Society S A [South Africa] in Johannesburg August 1958'.

Drafts, slide list, notes, one page with manuscript note 'later given by G. M. B. [Brown] as I had flu'.
- G.82 'Bushveld Intrusion, to O. U. Geological Society 5 March 1959'.

Draft, slide and transparencies lists.
- G.82A Manuscript and typescript drafts for Wager's contribution to a meeting at the Geological Society when a paper was presented by W.S. McKerrow and C. Campbell on 'The stratigraphy and structure of the lower Palaeozoic rocks of north-west Galway'. Their paper was later published in *Sci. Proc. Roy. Dublin. Soc.* 1 1960.
- G.83 'The mechanism of desposition of the Skaergaard layered series', talk to Oxford University Department 'Tea Club', February 1962, and also to 'Logan Club', n.d.

Notes and drafts.
- G.84 'Mechanism of adcumulus growth in the Skaergaard intrusion', lecture given at International Mineralogical Association Conference, Washington D.C., USA, April 1962.

Draft for lecture, abstract and heavily corrected draft for version published as 'The mechanism of adcumulus growth in the layered series of the Skaergaard intrusion' in *Min. Soc. Amer. Special Paper*, I, 1963.
- G.85 'The traces of sulphides in the Skaergaard intrusion', to Canadian Congress of Mining, Geology and Mineralogy 1962.

Lectures and papers

- G.86 'Lectures in Moscow and Leningrad 1962'.
Notes and drafts for four lectures in Moscow:
1. Characteristics of layered intrusions.
 2. The Skaergaard intrusion of East Greenland.
 3. Geochemistry of the Skaergaard intrusion.
 4. Mechanism of layered intrusion.
- Notes for lecture in Leningrad, 'Contrasted types of basic layered intrusion, Skaergaard and Rhum'.
- G.87 'Convection currents in magmas, to Durham Geological Society 28 February 1964'.
Draft, slide and transparency list, correspondence.
- G.88 Miscellaneous notes for lectures, no date or place.
'Lecture suggestions' of titles for possible talks.
- G.89 Invitations to lecture declined, deferred or with no accompanying text. 1934-1965.

SECTION H

PUBLICATIONS

H.1-H.109

H.1-H.99 is a chronological, though not a complete, sequence of drafts, diagrams, research notes and correspondence relating to Wager's publications, including book reviews, collaborative papers and posthumous work. Several of these are additional to the Bibliography accompanying the Royal Society *Memoir* of Wager by W.A. Deer, a copy of which is included at A.2.

Wager was notorious for constantly rethinking his ideas. His first pencil draft for a paper, often written in his Yorkshire home at Sawyersgarth, might be produced fairly quickly, but would pass through as many as five or six subsequent versions to accommodate new results or (often minor) changes of emphasis before being sent to a journal editor or publisher. Even then, Wager would revise proofs extensively and request changes or additions up to, or beyond, a deadline. It is clear from the surviving material that much was required from secretaries or co-workers before a script, diagram or illustration was considered acceptable for publication.

Equally, Wager was prepared himself to rewrite and recast papers by others to bring them into line with his own standards; this can be seen from the continuing papers on East Greenland published in *Meddelelser Om Grønland* by his students (H.22-H.24, H.25).

Many other drafts and notes for publications were kept with Wager's expedition and research material, and remain in the relevant sections. At H.99 are further invitations to write, which Wager declined.

Wager severely limited his involvement in editorial and advisory work. H.100-H.109 is relatively scanty, mainly confined to the *Journal of Petrology* and *Geochimica et Cosmochimica Acta*.

H.1-H.99

DRAFTS

H.100-H.109

EDITORIAL CORRESPONDENCE

Publications

H.1-H.99	DRAFTS	1935-1968
H.1	'Watkins' last expedition, by F. Spencer Chapman. A Review for <i>Geog. J.</i> March 1935'. Not in Bibliography.	
H.2	'A sketch of the geography and geology of the Himalaya Mountains and Tibet...Delhi: Government of India 1933-34', with a manuscript note 'Review to Royal Geographical Society journal about April 1935'. Not in Bibliography.	
H.3	'Review for Royal Geographical Society journal of Tilman's "Ascent of Nanda Devi" 1937'. Not in Bibliography.	
H.4	'Review for Royal Geographical Society of Paul Victor's "My Life with the Eskimo" ', ca 1937. Not in Bibliography.	
H.5	'Review of Rees' "Economic Geology" ', n.d. Not in Bibliography.	
H.6	'Outline of the Geology of Connemara', <i>Proc. Geol. Ass.</i> 50 , 1939. Heavily corrected manuscript and typescript draft. Not in Bibliography.	
H.7	'Greenland'. Article for Chambers's Encyclopaedia. Correspondence 1946-1948, drafts. Not in Bibliography.	
H.8-H.10	'Guide to Excursion C14. Skye and Morar', prepared for International Geological Congress XVIII Session - Great Britain 1948. Not in Bibliography. Wager, F.H. Stewart and W.Q. Kennedy were 'Directors' of the excursion.	
H.8	Correspondence with colleagues and editor 1947-1948.	
H.9	Manuscript and typescript drafts, all heavily corrected.	

Publications

- H.10 'Guide to the Geology of Skye and programme of excursions', prepared by F. W. Anderson 1940 and kept with the above.
- H.11, H.12 'Trace elements in a suite of Hawaiian lavas' with R. L. Mitchell. *Geochim. et Cosmochim. Acta*, **3**, 1953.
- H.11 Correspondence with colleagues, collaborator, editor, 1952-1953.
- H.12 Manuscript and typescript drafts, all heavily corrected. Data and tables.
- H.13 'Layered intrusions'. Lectures given to the Danish Geological Society in November 1952 and published in *Medd. Fra Dansk. Geol. For.*, **12**, 1953.

Corrected drafts, tables, diagrams, brief correspondence.

See also G.70, G.71.
- H.14 'Review of [Paul] Niggli "Rocks and Mineral deposits" '. For *Endeavour*. 1954. Not in Bibliography.
- H.15 'Review of [Alfred] Harker "Petrology for Students" ', 8th ed, revised by C. E. Tilley, S. R. Nockolds, M. Black. For *Geochim. et Cosmochim. Acta* 1955. Not in Bibliography.
- H.16-H.21 'Natural Processes of mineral concentration: concentration in Magmas'. Not in Bibliography.

This was Wager's contribution to the Third Inter-University Students' Geological Congress held in Durham, 4-7 January 1955. The lecture was published in the Proceedings of the Congress, and Wager also used the material as the basis for an article in *The Times Science Review* under the title 'Concentration of the elements in igneous rocks'.
- H.16 Correspondence, invitation, arrangements for lecture at Durham and for publication in the Congress Proceedings, May 1954 - December 1955.
- H.17 Thoughts and ideas.

Publications

- H.18 Manuscript and typescript drafts, heavily corrected, for lecture and summary.
- H.19 Abstracts, introductions, comments by Wager on lectures by others at Durham.
- H.20 Correspondence May 1954 - July 1955 with *The Times Science Review* about article, published as 'Concentration of the elements in igneous rocks', May 1955.
- H.21 Manuscript and typescript drafts, heavily corrected, diagrams for *Times* article.
- H.22-H.24 'The Petrography of the Prinsen Af Wales Bjaerge Lavas'.

This was Part V of *Geological Investigations in East Greenland*, reports of the British East Greenland Expedition 1935-1936, of which the previous four reports had been published by Wager, or Wager and W. A. Deer between 1934 and 1947. Part V was published in *Medd. Om Grøn.*, **135**, 1955 by Y. M. Anwar, an Egyptian doctoral student of Wager at Durham. The material is included here because it shows the major part played by Wager at every stage of the preparation and drafting of the work.

See also H.25.
- H.22 Correspondence 1954-1956.
- H.23 Manuscript and typescript drafts, all heavily corrected, mainly in Wager's hand.
- H.24 List of rock specimens, plates and figures.
- H.25 'A differentiated basic sill enclosed in the Skaergaard intrusion...'

This was Part VI of *Geological Investigations in East Greenland*, published in *Medd. Om Grøn.*, **137**, 1956. The author, C. J. Hughes, had been a member of the East Greenland Geological Expedition led by Wager and Deer in 1953. Wager submitted the paper to *Medd. Om Grøn.* with the comment:

/...

Publications

- /... 'The present paper is a detailed but useful piece of work, expressed commendably briefly, and I think it has been well carried out by Hughes' (letter of 7 December 1954).
Correspondence 1954-1955, typescript draft with manuscript corrections.
- H.26-H.31 'A chemical definition of fractionation stages as a basis for comparison of Hawaiian, Hebridean, and other basic lavas'. *Geochim. et Cosmochim. Acta*, **9**, 1956.
- H.26 Manuscript and typescript drafts, heavily corrected; 'Final draft' figures and tables (not in Wager's hand), some dated 1954, 1955.
- H.27 'V. early notes on basalts for Part III'. Notes, tables, calculations, mainly by Wager but also including work by W. A. Deer, for 'Geographical Investigations in East Greenland Part III' 1939.
- H.28 Miscellaneous thoughts and ideas on basalts. Includes 'Thulean Province. Lists of rocks used in various averages and reasons for selecting them. 2nd and 3rd November 1952'.
- H.29 Notes, data, tables, graphs, by Wager and others, on Thulean Province basalts.
- H.30 Notes, data, tables, graphs, by Wager and others, on Hawaiian, Icelandic and other lavas.
- H.31 Data for tables, February 1956.
- H.32 Review of A. Lombard: *Géologie sédimentaire*, for *Endeavour*. Not in Bibliography.
Correspondence, drafts 1957.
- H.33-H.35 'Sulphides in the Skaergaard intrusion, East Greenland', with E. A. Vincent and A. A. Smales and an Appendix by P. Bartholomé, *Econ. Geol.* **52**, 1957.

Publications

- H.33 Correspondence, information, comments by colleagues and editors on paper, and on a shortened version presented at Geochemical Symposium, Paris, France, 1956-1957.
- See also J.4.
- H.34 Typescript and manuscript drafts of paper, appendix and tables, all heavily corrected.
- H.35 Data, notes, tables, by Wager and others.
- H.36 'Funnel-shaped layered intrusions', with G. M. Brown, *Bull. Geol. Soc. Amer.* **68**, 1957.
- Typescript draft with corrections, brief correspondence 1957.
- H.37-H.39 'Indium content of rocks and minerals from the Skaergaard intrusion, East Greenland', with J. Van R. Smit and H. Irving, *Geochim. et Cosmochim. Acta*, **13**, 1958.
- H.37 Correspondence with collaborators 1956-1958.
- H.38 Manuscript and typescript drafts, heavily corrected.
- H.39 'Indium data etc.'
- H.40-H.50 'Beneath the Earth's Crust'. Presidential Address to Section C, British Association for the Advancement of Science, Glasgow, September 1958. Published in *The Advancement of Science*, No. 58, 1958.
- Wager took much trouble over this address as can be seen not only from the multiple corrected drafts but also from the bundles of notes and ideas under various titles, which he amassed beforehand.
- H.40 Early manuscript and very heavily corrected typescript drafts under Wager's original title 'The material beneath the earth's crust'.
- H.41 Later typescript drafts, both heavily corrected.

Publications

- H.42 'Script as read. It took 55 minutes'.
Typescript with many corrections and deletions. Included here is a copy of the printed version, also with manuscript corrections and deletions.
- H.43-H.50 Bundles of notes, ideas and information in preparation for lecture. All in Wager's hand, some substantial.
- H.43 'The material beneath the earth's crust. Very early drafts'.
- H.44 'Upper Mantle' (table).
- H.45 'Estimate of the results of partial melting'.
- H.46 'Calculation of mass of upper mantle'.
- H.47 'Ultrabasic rocks'.
- H.48 'Igneous rocks and earth constitution. Misc. ideas'.
- H.49 'Igneous rocks and earth constitution. Drafts and notes.'
- H.50 'Igneous rocks and earth constitution. Abs.' (Notes on the literature).
- H.51 'Differing powers of crystal nucleation as a factor producing diversity in layered igneous intrusions', *Geol. Mag.*, **46**, 1959.
Draft and diagrams, editorial correspondence. Included in the folder is a draft of a paper or lecture on 'Ease of crystal nucleation as a factor in the formation of rhythmic layering'.

Publications

- H.52-H.56 'Types of igneous cumulates', with G. M. Brown and W. J. Wadsworth, *J. Petr.* 1, 1960.
- This paper elaborated the idea of a two-stage crystallisation of rocks in a layered intrusion and introduced the term 'cumulates' as a generic name. G.M. Brown describes the story of the choice of this term (*Hargreaves*, Appendix III, pp.136-137):
- He wanted a single generic name which reflected the accumulation of piles of crystals. During lunch at University College in 1959, he sought the advice of the late Freddie Wells, Tutor in Classics, who suggested adopting the Latin word "cumulus", meaning a heap. Together LRW and I then began an exciting few weeks of word juggling, categorising the various rocks as "cumulates", pre-fixed by whatever mineral was most abundant in each. The nomenclature was then expanded to reflect various crystallisation processes and a definitive paper was written with a research student collaborator (John Wadsworth) in 1960.
- H.52 Correspondence with colleagues 1954-1961. The correspondence, which was found with the drafts, is about layered intrusions, but only that of 1960, 1961 refers to the paper and discusses the nomenclature.
- H.53 Wager's notes on 'cumulo', arising from 'talk with F. Wells July 23 1956'.
- Wager's note records 'He [Wells] has no suggestion of short words for pile of grounds, corn, sand etc. but cumulo means heap or pile and can be used with propriety.'
- H.54 Two early manuscript drafts 'Classification and nomenclature of cumulites'.
- H.55, H.56 'Earliest drafts'.
- H.55 'An early draft by G. M. B. [Brown]' titled 'The nomenclature of coarse-grained igneous rocks produced in the earlier stages of fractional crystallisation'.
- H.56 'Types of igneous cumulates'.
- Draft with additions and corrections by all collaborators.
- H.57, H.58 'The relationship between the fractionation stage of basalt magma and the temperature of the beginning of its crystallation', *Geochim. et Cosmochim. Acta*, 20, 1960.

Publications

- H.57 Correspondence 1960.
- H.58 Drafts and figures, heavily corrected.
- H.59 'Measuring geological time', with S. E. Moorbath, *New Scientist*, **8**, 1960.
Brief correspondence, heavily corrected drafts.
- H.60 'Recent advances in geochemistry', 650 word article for *The Times* supplement to mark the tercentenary of the Royal Society, published 19 July 1960. Not in Bibliography.
Brief correspondence, multiple drafts all heavily corrected.
- H.61, H.62 *Methods in Geochemistry* (Interscience 1960). Wager was co-editor with A. A. Smales, and co-author with Smales of the Introduction and with G. M. Brown of Chapter 2 'Collection and preparation of material for analysis'.
- H.61 Correspondence principally with co-editor A. A. Smales and publisher P. Rosbaud, but also with contributors, with comments or revision for papers, changes of title etc. 1956-1960.
- H.62 Manuscript drafts for chapter headings, contributions under various titles, by Wager and Smales.
- H.63-H.65 'The major element variation of the layered series of the Skaergaard intrusion...', *J.Petr.* **1**, 1960.
- H.63 Manuscript and typescript drafts, all heavily corrected.
- H.64 Data, tables, figures, calculations, a few in Wager's hand, but mainly by assistants.
- H.65 Correspondence and comments 1960.

Publications

- H.66 Review of: D. V. Nalivkin, *The geology of the USSR*, translated by S.I. Tomkeieff, for *Geochim. et Cosmochim. Acta*, ca 1961. Not in Bibliography.

Draft 1961.
- H.67 'Research on West Indian Volcanoes', short note for *Nature*. Not in Bibliography.

Draft and brief correspondence 1961.

See also B.408.
- H.68-H.72 'A note on the origin of ophitic texture in the chilled olivine gabbro of the Skaergaard intrusion', *Geol. Mag.* **98**, 1961.
- H.68 Early manuscript drafts, all heavily corrected, under the title 'Note on ophitic crystallisation and the relative number of crystal individuals'.
- H.69 Manuscript draft, heavily corrected, of paper under revised title as published, and of addendum dated July 1961 incorporating experiments by H. S. Yoder and J. F. Schairer (see H.72).
- H.70 Miscellaneous manuscript notes on chilled olivine gabbro, under various titles.
- H.71 Comments and revisions suggested by G. M. Brown, n.d.
- H.72 Correspondence with H. S. Yoder on chilled Skaergaard basalts, with experimental data as included in addendum to Wager's paper, December 1960-July 1961.
- H.73 Multiple heavily corrected drafts, and revised Bibliography, for Preface to the re-issue of Wager's and Deer's 1939 paper 'The Petrology of the Skaergaard intrusion, Kangerdlugssuaq'.

Publications

- H.74 'Ferrodiorite from the Isle of Skye', with E. A. Vincent, *Min. Mag.* **33**, 1962.
Manuscript draft, tables and data, correspondence with colleagues and editors, 1961-1962.
- H.75 'Igneous cumulates from the 1902 eruption of Soufriere, St. Vincent', *Bull. Volcanologique*, **204**, 1962.
Published version of a paper read at Volcanological Association meeting at Helsinki 1960.
Manuscript and typescript drafts, heavily corrected, tables, data, photographs, editorial correspondence, 1960-1962.
See also J.11.
- H.76, H.77 'The mechanism of adcumulus growth in the layered series of the Skaergaard intrusion', *Min. Soc. Amer. Special Paper* **1**, 1963.
Published version of a paper read at the International Mineralogical Association Symposium on Layered Intrusions, Washington DC, USA, April 1962.
See also J.15.
- H.76 Manuscript and typescript drafts of paper and abstract, all heavily corrected, brief editorial correspondence.
- H.77 Data and figures.
- H.78, H.79 'The history of attempts to establish a quantitative time-scale', *Quart. J. Geol. Soc. Lond.* **120**, 1964.
Published version of a paper given at Geological Society Phanerozoic Time-scale Symposium, 14 February 1964.
- H.78 Correspondence 1963-1964, circular of meeting.
- H.79 Manuscript and typescript drafts of paper, introductory remarks and contributions to discussion, all heavily corrected; tables and graphs; comments on paper by M. House.

Publications

- H.80 'Some radiometric rock ages and the problem of the southward continuation of the East Greenland Caledonian Orogeny,' with E. I. Hamilton, *Nature* **204**, 1964.

Manuscript and typescript drafts, all heavily corrected, data, tables.
- H.81-H.83 'Injected granite sheets of the Rongbuk Valley and the north face of Mount Everest', Wager's contribution to the Commemorative Volume for the 80th birthday of D. N. Wadia published by the Mining and Metallurgical Institute of India, 1965.

Not in Bibliography.
- H.81 Correspondence with editor, and with colleagues 1964.
- H.82 Manuscript and typescript drafts under various titles, all heavily corrected.
- H.83 Data and tables (not in Wager's hand), illustrations.
- H.84, H.85 'The form and internal structure of the alkaline Kangerdlugssuaq intrusion, East Greenland', *Min. Mag.* **34**, 1965.

This was Wager's contribution to a commemorative volume for C. E. Tilley.
- H.84 Manuscript and typescript drafts, all heavily corrected.
- H.85 Data, tables, diagrams, correspondence 1964.
- H.86, H.87 'Marscoite and related rocks of the Western Red Hills Complex, Isle of Skye', with E. A. Vincent, G. M. Brown and J. D. Bell, *Phil. Trans. A*, **257**, 1965.
- H.86 Correspondence; referees' comments; added footnote, etc. 1963-1964.
- H.87 Manuscript and typescript drafts and notes, heavily corrected.

Publications

- H.88 'Geological Investigations in East Greenland: The Geomorphology of Knud Rasmussens Land and the Kangerdlugssuaq Region'.
- This material was found on Wager's desk at his death. Intended as a further contribution to the continuing series published under the generic heading 'Geological Investigations in East Greenland' published by *Meddelelser Om Grønland*, it appears not to have been published.
- Manuscript and typescript drafts, heavily corrected, maps.
- H.89-H.96 *Layered igneous rocks*, with G. M. Brown, 1968, 588pp.
- This major publication with G. M. Brown had been long planned; some of the early ideas and contents lists date from 1954 (H.89). Part I, The Skaergaard intrusion, East Greenland, was almost entirely Wager's work; Part II. Examples of various types of layered intrusion, was almost entirely by Brown.
- This work was virtually complete and with the publishers by October 1965 when Wager and Brown wrote a joint preface. Wager's sudden death the following month left Brown charged with seeing the volume through to publication.
- H.89 Notes and ideas, some with various dates 1954 to 1960, on content and organisation of book, nomenclature of rocks, diagrams and tables.
- H.90 Quotations, for use in book.
- H.91 'Original tables'.
- H.92 Drafts and re-typings, 1964-1965.
- H.93 'Working copy of illustrations and early drafts of them.'
- H.94 Correspondence 1956, 1963 with colleagues on information for book.
- H.95 Correspondence 1967-1968, between Mrs Wager, G. M. Brown and publishers (Oliver and Boyd) on final stages of publication. Includes copy of Agreement, and some reviews of the book.

Publications

- H.101 Draft letter to E. Ingerson explaining the aims and organisation of the new journal, January 1950.
- H.102-H.107 General correspondence with colleagues and contributors on papers submitted for publication.
- H.102 1955-1960.
- H.103 1961 (i).
- H.104 1961 (ii).
- H.105 1962.
- H.106 1963.
- H.107 1965.
- H.108 Correspondence with P. Rosbaud (editor of *Geochim. et Cosmochim. Acta* until 1956) on general publishing projects, including Wager's and Smales's *Methods in Geochemistry* and the early stages of Wager's and Brown's *Layered igneous rocks*. Some letters from colleagues are included. 1956-1963.
- H.109 Advisory Committee on the Selection of Low-Priced Books for Overseas.
Advice on D. N. Wadia's *Geology of India* 1964.

SECTION J

SOCIETIES AND ORGANISATIONS

J.1-J.27

This section is relatively compact, since Wager preferred to devote his travelling time and activity outside the laboratory to expeditions and ongoing geological research. Furthermore, it is probable that the surviving material does not provide an adequate record of his involvement, for example, with the Geological Society, the Mineralogical Society of which he was President from 1960 to 1963, and the Geology and Geophysics Grants Sub-Committee of the Department of Scientific and Industrial Research which he chaired.

The most substantial material (J.7-J.27) relates to the Royal Society, and more especially to Wager's long service on the British National Committee for Geodesy and Geophysics' Vulcanology Subcommittee, during a complex period of national and international negotiations on the status of the several geological organisations and the scope of their work, with special reference to geochemistry and geochronology.

J.1	AGRICULTURAL RESEARCH COUNCIL
J.2	COUNCIL FOR THE PROMOTION OF FIELD STUDIES
J.3	GEOLOGICAL SOCIETY OF LONDON
J.4, J.5	INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY
J.6	ROYAL SOCIETY OF EDINBURGH
J.7-J.27	ROYAL SOCIETY

Societies and organisations

- J.1 AGRICULTURAL RESEARCH COUNCIL 1953-1954**
- J.1 Visit to Pedology Department, Rothamsted Experimental Station, with J. D. Bernal, 23 November 1953.
- Invitation, arrangements, background information on staffing, research programme, notes and drafts for report.
- J.2 COUNCIL FOR THE PROMOTION OF FIELD STUDIES 1952-1953**
- Wager was a member of the local committee for the Malham Tarn Field Centre, Settle, Yorkshire. He was rarely able to attend meetings and resigned from the committee in 1953.
- J.2 Brief correspondence only.
- J.3 GEOLOGICAL SOCIETY OF LONDON 1965**
- J.3 Volcanic studies group colloquium on Atlantic volcanoes, April 1965.
- Brief correspondence only.
- J.4, J.5 INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY 1957
(IUPAC)**
- Wager was a member of the Commission on Geochemistry.
- J.4 Correspondence and papers *re* 16th International Congress at Paris, France 18-24 July 1957.
- Information, circulars, travel arrangements for conference and for excursion 'Volcanisme d'Auvergne', abstracts of two papers by Wager and collaborators on trace elements in Skaergaard rocks, list of excursion participants.
- See also H.33.

Societies and organisations

- J.5 Annotated offprints on geology of the Auvergne.
- J.6 **ROYAL SOCIETY OF EDINBURGH** **1952-1955**
- J.6 Correspondence and papers mainly relating to a Symposium on 'The origin of tertiary gabbros' organised by the Society, 16 February 1953. Wager was among the contributors, and the discussion was led by Sir Edward Bailey.
- Includes notes and drafts of contributions by Bailey and Wager, discussion of research findings and of Wager's and Bailey's joint article 'Basic magma chilled against acid magma', *Nature, Lond.* **172**, 1953.
- J.7-J.27 **ROYAL SOCIETY** **1953-1965**
- J.7-J.22 **British National Committee for Geodesy and Geophysics** **1953-1965**
- Wager was a co-opted member of the Vulcanology Subcommittee from December 1953 and its Chairman from January 1960 until his death. He was a member of the British National Committee from 31 December 1957 and also served on the Vulcanological Expeditions Committee (Chairman: W. Q. Kennedy) from its inception in 1963.
- Apart from the Committee papers at J.7, J.8, the material is presented in chronological order as far as possible and concerns overseas conferences and meetings, the relations of existing geological organisations and the incorporation of areas of study such as geochemistry and geochronology.
- J.7, J.8 Agenda, minutes, reports submitted to Vulcanology Subcommittee and Vulcanological Expeditions Committee, attended or chaired by Wager, most annotated by him.
- A little correspondence, mainly on Wager's appointments, is included.
- J.7 1953-1963.
- J.8 1964-1965.

Societies and organisations

- J.9-J.22 General correspondence, 1954-1965.
- J.9 1954-1958.
- Correspondence and papers relating to the XIth General Assembly of the International Union of Geology and Geophysics (IUGG), Toronto, Canada, 3-14 September 1957.
- Wager attended the meeting as British National Committee voting delegate and, with J. Phemister, compiled a report for the Committee. The material includes financial arrangements, discussion and recommendations on organisation with special reference to geochronology, comments by H. Jeffreys on Wager's report and the discussions at the Assembly.
- J.10 1959-1960.
- Papers and brief correspondence on IUGG Symposium on Active Volcanoes, Paris, France, 16-19 September 1959. There was no official UK delegation to this Symposium.
- J.11, J.12 1959-1961.
- Correspondence and papers principally relating to the XIIth General Assembly of IUGG and International Association of Vulcanology meeting, Helsinki, Finland, 25 July - 6 August 1960.
- J.11 Correspondence with colleagues and officials on membership and funding of UK delegation, research in hand, Wager's paper on 'Igneous cumulates from the 1902 eruption of Soufriere, St. Vincent' given at Helsinki, draft paper by A. MacGregor to be given at Helsinki, report on the meeting prepared for the British National Committee by A. MacGregor, note on the meeting prepared for *Nature* by S. Tomkeieff.
- See also H.75.
- J.12 Correspondence and papers on Committee on Isotope Geology, Geochemistry, Age Determinations and Radioactivity of Rocks (CIGAR) and a symposium on Rock Age Determinations held at Helsinki 27 July. Wager was co-convenor of the symposium.
- J.13 1961.
- General correspondence on research, meetings and symposium, publications, funding, organisation.

Societies and organisations

- J.14 1961-1962.
- General correspondence on meetings, 'World Data Centers', Upper Mantle Project.
- J.15 1961-1962.
- Correspondence and papers relating to the Third General Meeting of the International Mineralogical Association, Washington D.C., USA, 12-30 April 1962. Wager was the leader of the UK delegation and gave lectures in Washington, Ottawa and elsewhere during the visit.
- Information, schedules, funding for UK delegation, Wager's lectures and visits during the trip.
- See also H.76, H.77 and G.84.
- J.16 1962-1963.
- Correspondence and papers on the problems of geochemistry and the reorganisation of the International Union of Geodesy and Geophysics (IUGG).
- J.17 1963.
- General correspondence on Vulcanology Subcommittee meetings, possible research projects.
- J.18 1963-1965.
- Papers and correspondence relating to the XIIIth General Assembly of IUGG and International Association of Vulcanology (IAV), Berkeley, California, USA, 19-31 August 1963.
- Information, schedule of meetings with special reference to the Upper Mantle Project, draft report on the IAV meeting.
- J.19 1963-1964.
- Miscellaneous shorter correspondence.

Societies and organisations

- J.20 1963-1964.
Correspondence and papers on proposed or completed expeditions, especially on Atlantic islands.
- J.21 1964-1965.
Correspondence and papers on meetings and work of Vulcanological Research Committee. Includes report on Vulcanological Research in UK, and on proposed booklet on 'United Kingdom contribution to the Upper Mantle Project'.
- J.22 1965.
Correspondence and papers on International Symposium on Vulcanology, New Zealand, 22 November - 3 December 1965, funding and arrangements for UK delegation.
- J.23-J.26 Exchanges and visits 1961-1963**
- J.23-J.25 Wager's visit to USSR, 19 May - 1 June 1962.
Wager visited and lectured in Moscow and Leningrad under the Royal Society's exchange agreement with USSR Academy of Sciences.
See also G.86.
- J.23 Correspondence with Royal Society and with colleagues, invitation, arrangements, draft of Wager's report on his visit 1961-1962.
- J.24 Correspondence and agreement with British Council on travel arrangements.
- J.25 Correspondence with Russian colleagues before visit, schedule, letters of thanks on return. Included here is brief correspondence inviting Wager to visit in 1960, which he declined.
- J.26 Correspondence and papers on visits of USSR geologists to UK under the exchange agreement, 1961-1963.

Societies and organisations

- | | | |
|-------------|---|-------------|
| J.27 | Committee for the Scott Polar Research Institute | 1965 |
| J.27 | Reappointment as Royal Society's representative on Committee for the Scott Polar Research Institute, Cambridge, for four years from January 1965. No other material on this appointment survives in Wager's papers. | |

SECTION K

REFERENCES AND RECOMMENDATIONS

K.1-K.31

K.1-K.11	THESES AND HIGHER DEGREES
K.12-K.23	ACADEMIC APPOINTMENTS, ELECTORAL BOARDS
K.24-K.26	SOCIETIES
K.27	PRIZES
K.28-K.30	REFERENCES AND TESTIMONIALS
K.31	MISCELLANEOUS

References and recommendations

K.1-K.11	THESES AND HIGHER DEGREES	1946-1965
K.1	Queen's University, Belfast, 1955.	
K.2	University of Birmingham, 1954.	
K.3	University of Bristol, 1963.	
K.4	University of Cambridge, 1950, 1958, 1960.	
K.5	University of Cape Town, South Africa, 1946.	
K.6	University of Durham, 1956, 1960.	
K.7	University of Leeds, 1953.	
K.8	University of Liverpool, 1953, 1955.	
K.9	Birkbeck College, University of London, 1957.	
K.10	University of Oxford, 1960.	
K.11	Requests to act as examiner (declined), 1963-1965.	

References and recommendations

K.12-K.23	ACADEMIC APPOINTMENTS, ELECTORAL BOARDS	1948-1964
K.12	University of California, Berkeley. Miller Research Fellowships, 1960, 1964.	
K.13	University of Cambridge, 1957, 1958-1962	
K.14	Trinity College Dublin, 1953, with Wager's notes and correspondence.	
K.15-K.17	University of Durham, 1948-1963.	
K.15	Chair of Geology, 1948.	
K.16	ICI Research Fellowships, 1949.	
K.17	1961, 1963.	
K.18	University of Leeds, 1962.	
K.19	University of London, 1956-1959. Wager served as External Expert on the Board of Advisers in Geology.	
K.20	King's College London, 1962.	
K.21	University of Manchester, 1963.	
K.22	University of Oxford, 1963.	
K.23	Requests for advice etc. declined, 1958-1963.	

References and recommendations

K.24-K.26	SOCIETIES	1945-1965
K.24	Royal Geographical Society, 1945.	
K.25	Royal Institute of Chemistry, 1956.	
K.26	Royal Society, 1957-1965	
K.27	PRIZES	1961
K.27	Vetlesen Prize, Columbia University, New York, 1961.	
K.28-K.30	REFERENCES AND TESTIMONIALS	1940-1965
	Many of these are for former University of Durham students	
K.28	B-H.	
K.29	J-P.	
K.30	R-W.	
K.31	MISCELLANEOUS	1954-1965
K.31	Requests for personal advice, information etc 1954-1965.	

SECTION L

CORRESPONDENCE

L.1-L.94

This section, though relatively short, reflects the many facets of Wager's career as explorer, mountaineer and geologist. It includes personal correspondence from friends and family as well as more specifically professional matters. Many of the correspondents, as will be seen from the general index, also appear elsewhere in the collection, since Wager usually kept letters along with the research or other material to which they refer.

Additional personal correspondence remains in family hands.

L.1-L.87

SCIENTIFIC AND GENERAL CORRESPONDENCE

L.88-L.94

SHORTER SCIENTIFIC CORRESPONDENCE

Correspondence

- | | | |
|-----------------|---|------------------------|
| L.1-L.87 | SCIENTIFIC AND GENERAL CORRESPONDENCE | 1919-1965 |
| | Correspondence with individuals, in alphabetical order, dated and indexed, with an indication of any information of particular biographical, scientific or historical interest. | |
| L.1 | Allen, P. | 1951-1965 |
| | Allen had been an undergraduate and subsequently a lecturer at the University of Reading, 1936-1945. After a period at Cambridge, 1946-1952, he returned to Reading as Professor of Geology. | |
| | Career, exchanges of material and results. Correspondence 1958 refers to Wager's Greenland kayak, held on long loan by Reading University Exploration Club. | |
| L.2, L.3 | Ahrens L.H. and others | 1951, 1956-1965 |
| | Ahrens, a South African geochemist, was appointed to the Readership in Mineralogy in the Oxford Department in 1952. In 1955 he returned to South Africa as Professor of Inorganic Chemistry, and later of Geochemistry, in the University of Cape Town. | |
| | Research, publications, career. | |
| L.2 | 1951 (one letter only), 1956-1960 includes memoranda on collection of very old minerals (in Swaziland and Rhodesia) for age and isotope programme. | |
| L.3 | 1961-1965. | |
| L.4 | Anwar, Y.M. | 1947-1951 |
| | Anwar, an Egyptian student, was a Ph.D. student with Wager at Durham University, on tertiary igneous rocks. See also H.22-H.24. | |
| | A little correspondence about other Egyptian students wishing to work at Durham is also included. | |

Correspondence

- | | | |
|------|--|-----------------|
| L.32 | Hutton, C.O.
Greenland rocks. | 1956, 1960 |
| L.33 | Ingerson, E. | 1946, 1961-1964 |
| L.34 | King, W.B.R. and King, M.G.
King was Wager's supervisor for his postgraduate research in Cambridge, and Professor of Geology at University College London. He later became Professor of Geology at Cambridge.
Personal correspondence. | 1931-1937 |
| L.35 | Kulp, L.J.
Kulp spent a sabbatical year 1958-1959 in the Oxford Department, on leave from Columbia University, New York.
Research, visits, publications, mainly on geochronology. Wager's letter dated 15 November 1965 is among the last he wrote. | 1957-1965 |
| L.36 | Kuno, H.
Japanese biotites. | 1959-1960 |
| L.37 | Lamb, H.H.
Volcanic dust in the atmosphere. | 1965 |
| L.38 | Leake, B.E. | 1962-1964 |
| L.39 | Lombard, B.V.
Bushveld and Skaergaard rocks. | 1948-1949 |

Correspondence

- | | | |
|------------|---|-------------------------|
| L.47 | Moore, L.R. | 1963-1964 |
| L.48 | Morse, S.A. | 1964-1965 |
| | Includes comments by G.M. Brown on a draft paper by Morse. | |
| L.49 | Neumann, H. | 1954-1958 |
| | Neumann was 'Konservator' at the Geological Museum, Oslo, Norway, and a colleague of T.F.W. Barth (<i>q.v.</i>). | |
| | Research, exchanges of personnel. | |
| L.50 | Nicholls, G.D. and others | 1956-1965 |
| | Nicholls was a lecturer at the University of Manchester and a member of the joint Oxford-Manchester expedition to East Greenland led by Wager and Deer in 1953. | |
| | Research and career. | |
| L.51, L.52 | Nygaard, A. Noe- and others | 1948-1964 |
| | Noe-Nygaard was based in the Mineralogical and Geological Museum, Copenhagen, Denmark. | |
| | General correspondence on East Greenland research, visits, lectures and publications, and exchanges of students and research workers with Wager's Departments in Durham and Oxford. | |
| L.51 | 1948-1955. | |
| L.52 | 1956-1964. | |
| L.53 | Odell, N.E. | various dates 1939-1957 |
| | Mountaineering and geological correspondence. Includes letters from Odell written during wartime service. | |

Correspondence

- L.61-L.63 **Robson, G.R. and others** 1950-1965
- Robson was a student of Wager at Durham, a volcanologist later working at the Seismic Research Unit of the University of the West Indies.
- Research, visits, career and appointments.
- L.61 1950-1956.
- L.62 1957-1960.
- Includes correspondence on Wager's visit to the West Indies in 1959 and proposed collaborative research, lists of specimens, etc.
- See also B.405.
- L.63 1961-1965.
- Continuing collaborative volcanological research. Correspondence continues to November 1965, immediately before Wager's death.
- L.64 **Ruttledge, H.** 1934, 1937
- Ruttledge was leader of the 1933 Everest expedition, and a member of the 1936 attempt.
- L.65 **Russell, A.E.I.M.** 1950-1958
- Correspondence on the possible bequest and housing of Russell's mineralogical collection in Oxford. The collection was eventually bequeathed to the British Museum (Natural History).
- Includes English and Latin versions of the Public Orator's presentation of Russell for an Honorary D.Sc. at Oxford 1956.
- L.66 **Sandford, K.S.** various dates 1931-1934
- Sandford was Reader in Geology at Oxford 1948-1967, and acted as deputy professor 1965-1967.

Correspondence

- L.67 **Seward, A.C. and Seward, M.A.** 1934-1942
- A.C. Seward was Master of Downing College Cambridge 1915-1936, and Professor of Botany 1906-1936. He was an authority on fossil plants with a strong interest in geology.
- Includes obituary of Seward 1941 and a little correspondence with his second wife, Mary, 1942.
- L.68 **Shimazu, Y.** 1963
- Two-phase convection.
- L.69 **Shipton, E.E.** various dates 1941-1964
- Shipton was one of the most famous mountaineers of his time. He was a member of the 1933 Everest expedition and, with Wager, of the Sikkim expedition on the return from Tibet. Most of the letters (addressed to 'My dear Wagers') are mainly accounts of expeditions and other activities undertaken or proposed.
- L.70 **Smith, W.C.** 1950-1951
- L.71 **Sørensen, H.** 1950-1951
- Mainly arrangements for Sørensen, a pupil of Noe-Nygaard at Copenhagen, to work with Wager at Durham.
- L.72, L.73 **Stewart, F.H. and others** 1951-1965
- Stewart was a lecturer at the University of Durham, appointed by Wager in 1944, and was later Regius Professor of Geology at the University of Edinburgh. He was knighted in 1974.
- Research, expeditions, career and appointments.
- L.72 1951-1956.
- L.73 1956-1965.

Correspondence

- | | | |
|------|---|-----------------|
| L.74 | Sutton, J. | 1965 |
| L.75 | Taylor, G.I. | 1964 |
| | Brief correspondence only, on film of lava flow. | |
| L.76 | Tilley, C.E. | 1953-1965 |
| | Tilley held the Chair of Mineralogy and Petrology at Cambridge until 1961, his successor being W.A. Deer. | |
| | Research, visits, appointments. | |
| L.77 | Tomkeieff, S.I. | 1950, 1959-1963 |
| | Tomkeieff was a petrologist of Russian extraction, at King's College, Newcastle-upon-Tyne. Correspondence 1950 refers to his joint publication with W.J. Arkell of <i>English Rock Terms, chiefly as used by miners and quarrymen</i> , Oxford, 1953. | |
| L.78 | Trevelyan, G.L. | 1926 and n.d |
| | Accounts of climbing with Cambridge friends. | |
| L.79 | Tuttle, O.F. | 1951-1954 |
| | Felspars in Skye and Greenland rocks. | |
| L.80 | Vincent, E.A. | 1950, 1965 |
| | Vincent was one of Wager's oldest colleagues and friends, having entered the University of Reading in 1936. In 1946 he was appointed lecturer in Mineralogy and Crystallography at the University of Durham, moving to Oxford in 1951, working primarily on chemical analyses of rocks and minerals. He was appointed to the Chair of Geology at Manchester in succession to W.A. Deer in 1962 and returned to Oxford as Wager's successor in 1965. | |
| | The material covers all aspects of Vincent's career from 1950: appointments, research and publications etc. Includes Vincent's ideas for research and laboratory requirements at Oxford 1950-1951, departmental news during Wager's absence on sabbatical leave 1959 and work for <i>Geochimica et Cosmochimica Acta</i> . | |

Correspondence

- L.81 **Waddington, C.H.** ca1926, 1934
- Waddington, a Cambridge friend, became a distinguished geneticist.
- Personal correspondence.
- L.82 **Wager, H.G.** 1931-1964
- Wager's younger brother, a botanist, worked in the Botany Department at Trinity College, Dublin before returning to work in Cambridge (*Hargreaves* p.22). He accompanied Wager on the 1932 East Greenland Expedition and, with his wife, on the 1935-1936 East Greenland Expedition.
- Personal and scientific correspondence.
- L.83 **Wells, M.K.** various dates 1956-1962
- L.84 **Westoll, T.S.** 1959-1965
- L.85 **Whittard, W.F.** ca1926-1962
- Whittard was a mountaineering and geological contemporary of Wager at Cambridge. He was Professor of Geology at the University of Bristol 1937-1966.
- Personal and scientific correspondence.
- L.86 **Woodward, H.S.** 1919
- Sir Henry Smith Woodward was a palaeontologist and Keeper of Geology at the British Museum (Natural History).
- The material, which was found among Wager's papers, consists of two letters, probably January 1919, to R.H. Rastall and to H. Winwood mainly on matters relating to the *Geological Magazine* which Woodward co-founded in 1864 and of which he was sole editor until 1918. An obituary of Woodward is included.
- L.87 **Wordie, J.M.** various dates 1933-1938, 1958
- Wordie was an explorer and glaciologist, a friend of Wager from Cambridge days. He was Master of St. John's College Cambridge and knighted in 1957.

Correspondence

L.88-L.94	SHORTER SCIENTIFIC CORRESPONDENCE	1938-1965
L.88-L.90	Brief exchanges with colleagues, including some information on research or personal news. In alphabetical order. 1943-1963.	
L.88	B. - F.	
L.89	G.	
L.90	R. - W.	
L.91	Correspondence on rock specimens, samples sent or requested, information and identification. Mainly but not all of Skaergaard rocks. 1955-1965.	
L.92	Requests for information, references, photographs sent or received. 1954-1965.	
L.93	Requests and thanks for reprints sent or received, some with additional information. 1938-1965.	
L.94	Requests to visit or work in Department, letters of thanks. 1948-1964.	

SECTION M

NON-TEXTUAL MATERIAL

M.1-M.117

M.1-M.62

PHOTOGRAPHS

M.63-M.99

PLATES, SLIDES, TRANSPARENCIES

M.100-M.117

MAPS AND DRAWINGS

Non-textual material

M.1-M.62	PHOTOGRAPHS	1926-1954, n.d.
	M.1-M.31	East Greenland
	M.32-M.39	Everest
	M.40-M.48	Ireland
	M.48-M.60	Scotland
	M.61, M.62	South Africa
M.1-M.31	East Greenland	1930-1953, n.d.
M.1	British Arctic Air Route Expedition (BAARE) 1930-1931. Envelope of air photographs, maximum enlargements, numbered on verso.	
M.2, M.3	British East Greenland Expedition (BEGE) 1935-1936.	
M.2	Box 'BEGE 1935-6 Enlargements 1957', numbered on verso.	
M.3	Box 'Air Photos, main set. W. Kangerdlugssuaq and Skaergaard', numbered on box and verso.	
M.4-M.18	Fifteen envelopes of small format air photographs, dated May 1947, supplied by Geodetic Institute, Copenhagen, numbered, most with a manuscript identification or comment by Wager.	
M.19-M.24	Six envelopes of air photographs, n.d., supplied by Geodetic Institute, Copenhagen, most with a manuscript identification by Wager.	
M.25-M.30	East Greenland Geological Expedition (EGGE) 1953.	
M.25-M.28	Four envelopes of films numbered 3-10, taken with Leica camera, numbered on envelope and on verso.	

Non-textual material

- M.29, M.30 Two envelopes of films numbered 1-30 taken with Rolleiflex camera, numbered on envelope and on verso.
- M.31 Envelope of 'Kangerd. photos', numbered on verso, of rocks in Oxford University Museum collection. N.d.
Two photographs showing detail of layered intrusions. N.d.
- M.32-M.38 Everest 1933**
- M.32, M.33 Two envelopes, small format photographs 'Film 1, Film 2'.
- M.34, M.35 Two envelopes, larger format photographs 'Film 1, Film 2'.
- M.36 Envelope of 'M.E. Photomicrographs' (geological specimens).
- M.37 Envelope of 'M.E. Photomicrographs' (geological specimens and landscapes).
- M.38 Envelope of photographs of injected granite sheets, with a note on the contents supplied by E.A. Vincent.
- M.39-M.47 Ireland 1928, 1929, 1954**
- M.39-M.43 Five envelopes of photographs and a drawing of Connemara rocks, some dated 1928, 1929.
- M.44-M.47 Four envelopes of small format photographs of Oxford University Department excursion to Northern Ireland, 1954.
- M.48-M.60 Scotland 1926-1952**
- M.48 Photographs of Arran, small format, some relating to early 1926 expedition (see B.355).

Non-textual material

- M.49 Photographs of Arran, larger format.
- M.50-M.52 Three envelopes of photographs of Mull and Ardnamurchan, taken on International Geological Congress excursions led by Wager in 1948 Not all taken by Wager. Includes group and geological photographs.
- M.53-M.55 Three envelopes of photographs of Rhum and St. Kilda 'Film 1', 'Film 2', 'Film 3'.
- M.56 Packet of photographs of St Kilda 1949.
- M.57, M.58 Two envelopes of photographs of St Kilda sent by Wager's companions W.F. Cassie and G.R. McLachlan on the 1952 expedition.
- M.59 Two envelopes of photographs of St Kilda 1952, by W.F. Cassie and T.B. Bagenal.
- M.60 Enlargements of St Kilda photographs by Cassie and McLachlan.
- M.61, M.62 South Africa n.d.**
- M.61 Air photographs and landscape, many annotated with locations of specimens.
- M.62 Miscellaneous photographs of South African mines and geology.

Non-textual material

M.63-M.99	PLATES, SLIDES, TRANSPARENCIES	1930-1953, n.d.
	M.63-M.88b	East Greenland
	M.89-M.93	Everest
	M.94	Ireland
	M.95-M.97	Yorkshire
	M.98, M.99	Miscellaneous
M.63-M.88b	East Greenland	1930-1947, n.d.
M.63-M.70	British Arctic Air Route Expedition (BAARE) 1930-1931.	
M.63	Box 'Negatives and copy negs. 1930-1931'.	
M.64	Wooden box 'BAARE ¼ plates'.	
M.65-M.67	Three boxes 'V.P.K. film E.G. 1930'.	
M.68	Box 'BAARE Developed Plates Good'.	
M.69	Box 'BAARE Negs'.	
M.70	Box 'BAARE Negs. Developed Oct. 6 1931'.	
M.71-M.73	'Mikki' Expedition 1932.	
M.71	Box of 'Blossiville Coast E.G. II 1932'.	
M.72	Box 'Kangerdlugssuaq Mikki E.G. II', dated July-August 1932.	

Non-textual material

- M.73 Box 'E.G. II Mikki's Exped.'
- M.74, M.75 Two boxes 'Greenland Microphotographs Kap Dalton', one box dated October 1934.
- M.76-M.79 British East Greenland Expedition (BEGE) 1935-1936.
- M.76, M.77 Two boxes 'BEGE'.
- M.78, M.79 Two boxes 'BEGE', small format.
- M.80-M.88b Miscellaneous East Greenland.
- M.80 Box 'Microphotos taken Christmas vacation 1937', Skaergaard rock sections, small format.
- M.81 Box 'Microphotos Skaergaard rocks June 1938', small format.
- M.82 Box 'Microphotos Easter vacation 1938', Skaergaard.
- M.83 Box 'Copies of rocks in air and water 4/4/40', Kangerdlugssuaq rock specimens.
- M.84 Box 'Negatives of diagrams for Stratig. E.G. paper' (Geological investigations in East Greenland, Part IV. *Medd om Grøn*, 134, 1947).
- M.85 Box 'Negs Greenland', small format.
- M.86 Box 'R.G.S Negatives of maps etc. given to me L.R.W', small format.
- M.87 Box 'Low power rock sections. Kangerdlugssuaq Intrusion thin sections'.

Non-textual material

M.98, M.99	Miscellaneous	n.d.
M.98	Grey box 'Copy Transparencies. Skaergaard, Bushveld, Skye, Rhum'. Used for lectures and teaching.	
M.99	Wooden box of slides used for Oxford lectures and teaching.	
M.100-M.117	MAPS AND DRAWINGS	1930-ca 1968, n.d.
	Most of these are, or include, original work done in the field on expeditions, on mapping, contouring, location of specimens etc. in East Greenland. They therefore constitute records of Wager's work as explorer and geologist, and are of considerable historical interest. Some contributions by colleagues may be included but most is by Wager himself.	
M.100-M.102	Large envelope, inscribed 'BAARE maps etc. mainly Metamorphic Complex. 1932 maps with original geology'. 3 folders of material.	
M.100	Maps, tracings and drawings, some dated 1930, 1931, 1932 (the 'Mikki' expedition), with very detailed information.	
M.101	'Map by Michael Spender based on terrestrial photogrammetry, Mikkelsen's Expedition 1932'.	
M.102	'Angmagssalik area', material on East Greenland placenames, including later information and correspondence 1938.	
M.103	Envelope 'Copy maps of Angmagssalik area 1930-1931 BAARE'.	
M.104	Large cardboard folder 'Skaergaard Intrusion. Original maps and photographs with localities'. Contents include material from 1932, 1935-1936 and 1953 expeditions. Detailed list on cover.	
M.105	Large cardboard folder 'Skaergaard Intrusion. Copies of original maps and photographs with localities'. Detailed list on cover.	

Non-textual material

- M.106 Large cardboard folder 'Kangerdlugssuaq Intrusion and Kaerven. Original maps and photographs with localities'. 1932, 1935-1936 and 1953 expeditions.
- M.107 Folder 'Original Field Maps. Kap E[dvard] Holm Intrusion 1932 and 1935-1936'.
- M.108 Diagram of 'Skaergaard vertical section' drawn by Wager ca 1960 recording localities and heights where specimens were found.
- M.109 Enlarged map of 'Kangerdlugssuaq Central Intrusion' with a geographical description (perhaps for an exhibition).
- M.110 Map of 'BEGE 1935-1936', showing contours, locations of specimens etc.
- M.111 Contour map of part of Skaergaard, showing contours, locations of specimens etc.
- M.112 Large photocopy map of Northern Europe with notes by Wager on geological ages of basalt rocks (shown in millions of years), perhaps related to ideas on continental drift.
- M.113 Working locality sheet, in pencil, red and blue ink showing specimens from 1930, 1932, 1935-1936 and 1953 expeditions. Paper on board.
- M.114 Tracing of map, made for E.A. Vincent ca 1967-1968.
- M.115 Framed geological map of Skaergaard Intrusion 1939.
- M.116 Framed geological map of Skaergaard Intrusion 1961.
- M.117 Framed photograph, Greenland, ca 1931.

APPENDIX

PERSONAL AND GEOLOGICAL DIARIES

APP.1-APP.69

The core of this material, which currently remains in family hands, is a sequence of pocket-size notebooks, similar but not identical in format, numbered 1-53 on the base of the spine. They record Wager's expeditions, comprising both general and specifically geological diaries; they bear Wager's original numeration in Roman numerals on the spine, and his name, date and indication of contents on the inside. Like the rock catalogues listed elsewhere, these notebooks were renumbered with Arabic numerals at a later date within the Oxford Department and provided with indexes pasted inside the front cover.

The geological diaries for each expedition, which include diagrams and sketches as well as narrative, are not continuous entries since not every day could be spent in this way. Most have a list of dates and sites provided by Wager on the front page. Only terminal dates are given in the entries below.

The items numbered as App.54-App.69 are additional notebooks which do not figure in the numbered sequence though they may antedate or coincide with them. They are presented as far as possible in chronological order.

APP.1-APP.14	BRITISH ARCTIC AIR ROUTE EXPEDITION (BAARE)
APP.15-APP.17	SCORESBY SOUND SECOND EAST GREENLAND EXPEDITION ('MIKKI EXPEDITION')
APP.18-APP.21	BRITISH MOUNT EVEREST EXPEDITION
APP.22	CHARCOT <i>POURQUOI PAS?</i> EXPEDITION
APP.23-APP.35	BRITISH EAST GREENLAND EXPEDITION (BEGE)
APP.36-APP.42	HEBRIDES
APP.43-APP.46	EAST GREENLAND GEOLOGICAL EXPEDITION (EGGE)
APP.47-APP.50	SOUTH AFRICA

Appendix: personal and geological diaries

APP.51	ALPS AND ITALY
APP.52	WEST INDIES
APP.53	RUSSIA
APP.54-APP.69	ADDITIONAL NOTEBOOKS

Appendix: personal and geological diaries

APP.1-APP.14	BRITISH ARCTIC AIR ROUTE EXPEDITION (BAARE)	1930-1931
	App.1-App.10	General Diaries
	App.11-App.14	Geological Diaries
App.1-App.10	General Diaries	
App.1	'I 2 July - 29 July 1930'. Entries run 2 July - 3 August. Inside an envelope pasted to the rear inside cover is a pencil draft letter to his father dated 31 October 1930, which Wager calls 'a sort of will' suggesting dispositions of his estate.	
App.2	'II 29 July - 26 August 1930'. Entries start 3 August, continuing from Book I.	
App.3	'III 26 August - 26 September 1930'. Entry for 26 August continues from Book II.	
App.4	'IV 27 September - 24 October 1930. 23 December 1930 - 8 January 1931'. There is a note after the entry for 24 October: '25 October to 20 December were of the journey to the Ice Cap Station and are separate.' (These are App.9 and App.10)	
App.5	'V 8 January - 31 January 1931'. Entry for 8 January continues from Book IV, last entry is dated 5 February. Three photographs are enclosed in an envelope pasted to the rear inside cover.	
App.6	'VI 31 January - 3 April 1931'. First entry continues 5 February from Book V. At rear of book, lists of books read or to be read.	

Appendix: personal and geological diaries

- App.7 'VII 4 April - 3 June 1931'.
- App.8 'VIII 20 June - August 1931'.
- App.9 'XI Ice Cap Journey. First part from 26 October to 29 November 1930'.
Entries start 25 October. Includes a tabulated diary of events with a note of the weather and of the distance travelled each day.
- App.10 'X Ice Cap Journey and Second Forel Journey. Second part [of Ice Cap Journey] from 30 November to 19 December 1930. End part of Second Forel Journey 3-9 June 1931'.
Entries continue to 20 December.
At rear of book, tabulated diary of 'Forel Journeys', an attempt to climb Mont Forel, then thought to be the highest mountain in the Arctic.
App.9 and 10 were rebound in 1961 and have Wager's Oxford address.
- App.11-App.14 Geological Diaries**
- App.11 'Geology I' 13 July - 1 September.
- App.12 'Geology II' 1 September (continued from Book I) - 28 January 1931.
- App.13 'Geology III' 6 February - 1 May 1931.
- App.14 'Geology IV' 11 May - 30 July 1931.

Appendix: personal and geological diaries

APP.15-APP.17	SCORESBY SOUND SECOND EAST GREENLAND EXPEDITION ('MIKKI EXPEDITION')	1932
	App.15	General Diary
	App.16-App.17	Geological Diaries
App.15	General Diary	
App.15	'I Ejnar Mikkelsen's Expedition to East Greenland Summer 1932'. One volume only 29 June - 3 August (last dated entry).	
App.16-App.17	Geological Diaries	
App.16	'Geology I' 29 June - 14 August.	
App.17	'Geology II' 15 August - 8 September.	
APP.18-APP.21	BRITISH MOUNT EVEREST EXPEDITION	1933
	App.18, App.19	General Diaries
	App.20, App.21	Geological Diaries
App.18, App.19	General Diaries	
App.18	'Everest I'. 10 February - 28 May 1933. At rear of book, a few meteorological notes, lists of Nepali words. Interleaved at entry for 3 May are a sketch map and note of 'alternative route' in the hand of J. L. Longland.	

Appendix: personal and geological diaries

- App.19 'Everest II'. 28 May continued - 31 July 1933.
Includes notes on photography, plants, journey to Lhonak La.
- App.20, App.21 Geological Diaries**
- App.20 'Everest Geology I' 7 March - 30 June 1933.
- App.21 'Everest Geology II' 8 July - 31 July 1933.
Enclosed at front of book is correspondence on Everest rocks 1952, 1953.
- APP.22 CHARCOT *POURQUOI PAS?* EXPEDITION 1934**
- App.22 Geology Diary
'East Greenland with Dr J B Charcot on the Pourquoi Pas Summer 1934'.
20 July - 2 August. One volume only.
- APP.23-APP.35 BRITISH EAST GREENLAND EXPEDITION (BEGE) 1935-1936**
- App.23-App.31 General Diaries
App.32-App.35 Geological Diaries
- App.23-App.31 General Diaries**
- App.23 'I BEGE 1935-1936 6 July - 1 August'.
- App.24 'II BEGE 1935-1936' 5 - 27 August.
At rear of book, list of rations, books read.

Appendix: personal and geological diaries

- App.25 'III BEGE 1935-1936 September 2 - October 15'.
- App.26 'IV BEGE 1935-1936 October 16 - November 20'.
- App.27 'V BEGE 1935-1936 November 24 - December 27'.
- App.28 'VI BEGE 1935-1936 January 5 - February 10'.
- App.29 'VII and IX BEGE 1935-1936 February 16 - March 1 and 25 April - 13 June'.
The intervening period is the 'Spring Journey' recorded in Book VIII, App.30.
- App.30 'VIII BEGE 1935-1936 Spring Journey. March 6 - 12 April'.
Diary continues without dates for a further week.
- App.31 'X BEGE 1935-1936' 17 June - 5 July.
- App.32-App.35 Geological Diaries**
- App.32 'Geology I BEGE 1935-1936' 12 September 1935 - 17 August 1936.
Includes lists of specimens, photographs to be taken.
- App.33 'Geology II BEGE 1935-1936' 15 January - 19 June.
- App. 34 'Geology II BEGE 1935-1936' 26 June - 20 July.
- App.35 'Geology IV BEGE 1935-1936' 24-30 July and 12 August.
Several loose pages of notes and diagrams inserted at entry for 29 July.

Appendix: personal and geological diaries

App.44-App.46

Geological Diaries

App.44

'EGGE 1953 Geol. I' 25 July - 6 August.

Sketches and photograph of rock at rear of book.

App.45

'EGGE Geol. II' 12 August - 7 September 1953.

App.46

'EGGE Geol. III' 7 September (continued) - 20 September 1953.

Last entry dated 25 September.

APP.47-APP.50

SOUTH AFRICA

1958

These do not distinguish between 'general' and 'geological' diaries.

App.47

'South Africa I' 17 June - 12 July 1958.

Some miscellaneous notes at rear of book.

App.48

'South Africa II' 13-26 July 1958.

App.49

'South Africa III' 28 July - 6 August 1958.

Includes sketches of layered intrusions. At rear of book, manuscript draft 'Differing processes of crystal nucleation as a factor producing diversity in layered igneous intrusions'.

App.50

'South Africa IV' 11-17 August 1958.

Miscellaneous notes and list of specimens at rear of book.

Appendix: personal and geological diaries

APP.51	ALPS AND ITALY	1959
App.51	'Alps and Italy 1959'. At front of book, diary entries, none dated. At rear of book, list of specimens.	
APP.52	WEST INDIES	1959
App.52	'Geology West Indies 1959 (one book only)' 28 October - 24 November. Some miscellaneous notes at rear of book.	
APP.53	RUSSIA	1962
App.53	'Russia 1962' 19 May - 1 June. Enclosed at rear of book is Wager's report to the Royal Society on his visit, 4pp typescript.	
APP.54-APP.69	ADDITIONAL NOTEBOOKS	1924-1964
App.54	'Calif. Oregon 1963 Sweden 1964'. Notebook of same format as other diaries, but not included in the numbered sequence. Miscellaneous notes and geological observations. Both ends of book used.	
App.55	'Lakes March 1925'. Small soft-backed exercise book, entries 22-29 March.	

Appendix: personal and geological diaries

- App.56 'North Wales June 1925'.
Small soft-backed exercise book, entries 13-21 June.
- App.57 'Alps 1925'.
Small soft-backed exercise book, entries 17 July - 18 August. A note by Wager on front page dated February 1944 lists climbs for 1924, for which no diary survives.
- App.58 'Alps 1926 I'.
Small soft-backed exercise book, entries 17 July - 18 August. A note by Wager on front page dated February 1944 lists climbs for 1927, for which no diary survives.
- App.59 'Alps 1926 II'.
Small soft-backed exercise book, some entries dated 20-28, no month given.
- App.60 'The Bag of the Travelling Morris 1927'.
Small soft-backed exercise book of tour with Cambridge Morris Men through North Oxfordshire villages.
- App.61 'Alps 1928 I'.
Small soft-backed exercise book, entries 13-27 July. On loose pages at front of book is 'List sent in for A C [Alpine Club]' listing Wager's climbs 1924-1927.
- App.62 'Alps 1928 II'.
Small soft-backed exercise book. Dated entries run 28 July - 1 August, also descriptions and sketches, bills and accounts.
- App.63 Pocket Register for Climatological Observations used on British Arctic Air Route Expedition (BAARE) 1930-1931.

/...

Appendix: personal and geological diaries

- /... Dated meteorological observations at Base Camp and Ice Cap Station, almost all in Wager's hand. Includes some loose pages of calculations and diagrams and invoices for 1935-1936 BEGE expedition.
- App.64 'Nepali'.
Small hand-backed pocket book 'Book of Nepali words' and some loose pages. A 'British Mount Everest Expedition 1933' label is pasted in, but the book is not included in the Everest sequence.
- App.65 'Eskimo words'.
Small hand-backed pocket book. A BEGE 1935-1936 label is pasted in, but the book is not included in the BEGE sequence.
Miscellaneous accounts at rear of book.
- App.66 Small red soft-backed exercise book of insect collections made by H.G. Wager. A 'BEGE 1935-1936' label is pasted in, but the book is not included in the BEGE sequence.
Includes loose pages on packing and luggage for expedition.
- App.67 War Office Handbook on clothing and equipment required in cold climates, 1941.
Included on loose pages are miscellaneous official notes on snow camping and training, report by Wager and A. Stephenson on their work on snow training in Scotland 2-15 February [1943], and draft lecture by Wager (on Everest) for soldiers training on mountain warfare.
- App.68 'Camp Equipment 1'.
Small soft-backed exercise book. At front of book, miscellaneous lists, few pages used. At rear of book, lists of clothes and gear for 1930-1931 BAARE expedition.
- App.69 'Camp Equipment 2'.
Small soft-backed exercise book. Miscellaneous lists for visits to Lakes 1924, Alps, Skye 1947, Broads 1951, Rhum, St Kilda 1952 and other visits.

INDEX OF CORRESPONDENTS

AHRENS, Louis Herman	F.19, H.103, H.105, L.2, L.3
ALDRICH, L. Thomas	J.13, J.16
ALEXANDER, W. G.	J.1
ALLEN, Percival	A.41, A.45, A.48, B.109, E.28, E.30, L.1
ALMOND, David Coates	L.73
AMDRUP, G.C.	B.47, B.105, M.102
AMERY, Leopold Stennett	B.272
ANDERSON, Ernest Masson	B.108, B.109, B.114
ANDERSON, Frederick William	H.8 See also H.10
ANDERSON, John Graham Comrie	B.308, E.36
ANDERSON, William	B.344, B.421
ANDREW, Gerald	B.344
ANDREWS, D.P.G.	B.105
ANWAR, Yehia Mohammed	H.22-H.24, L.4
APPLEBEY, Malcolm Percival	A.40, A.48, A.56
ARBBER, Muriel Agnes	A.48, A.56
ARKELL, William Joscelyn	A.56
ARNASON, Arsell	B.28
AUDEN, George Augustus	L.5
AUDEN, John Bicknell	L.5
BACHARACH, Alfred Louis	A.48
BACKLUND, H.G.	B.108, B.272
BAGENAL, Timothy	B.351
BAGLEY, Donald	B.270
BAILEY, Douglas	A.56

Index of correspondents

BAILEY, Sir Edward Battersby	A.37, A.41, A.48, A.54, A.56, B.33, B.101, B.106, B.272, B.345, E.7, F.2, H.52, J.6, L.6 See also B.354, B.358, B.363
BALK, Robert	B.108, B.109
BANNISTER, Frederick Allan	A.56, B.36, B.108, F.8, F.10
BARTH, Tom Frederick Weybye	G.70, L.7
BARTHOLOMÉ, Paul	H.33
BEALE, Sir John	B.91
BECKETT, Philip Henry Trim	E.12, E.13
BEER, Sir Gavin Rylands de	A.125
BERTRAM, George Colin Lawder	B.135, B.141, B.143, B.461
BIRCH, Albert Francis	L.88
BLACKETT, Patrick Maynard Stuart, Baron	E.21, E.28
BLAKENEY, T.S.	B.283, B.285, L.57
BØGVAD, Richard	B.106
BOND, Geoffrey	L.88
BOSWELL, Percy George Hamnall	A.37, A.41, A.48, A.56, B.106, B.272
BOUSTEAD, Sir John Edmund Hugh	K.24
BOWDEN, Frank Philip	A.56
BOWEN, Edmund John	A.55
BOWEN, Humphry J.M.	F.20
BOWEN, Norman Levi	B.424
BOWES, Donald Ralph	E.20
BOWIE, Stanley Hay Umphray	B.261, B.272
BOYD, J. Morton	B.351, E.7
BRAMMALL, Alfred	B.106, B.108
BRIGHTON, Albert George	A.48
BRINDLEY, George William	B.118
BROCKLEBANK, Sir Thomas Aubrey Lawies	B.285

Index of correspondents

BROTHERS, Raymond Nicholas	B.119, L.93
BROWN, Sir (George) Malcolm	B.350, B.392, B.407, H.52, H.55, H.65, H.71, H.95, H.97 See also B.364, B.379, B.391, H.72, L.8, L.48, L.58
BROWN, Peter Evans	B.467, L.94
BROWNE, Benjamin Chapman	B.461, F.30, L.61
BUDDINGTON, Arthur Francis	B.107
BULLARD, Sir Edward Crisp	A.48, B.254, E.21, E.36, E.37, K.26, L.9
BULLOUGH, Monica, Lady	B.350
BULMAN, Oliver Meredith Boone	A.48, E.1, L.10
BURN, William Lawrence	K.15
BUTLER, Arthur James	A.56
BUTLER, John Russell	J.15, L.3
CANN, Johnson Robin ('Joe')	J.20
CARPENTER, Geoffrey Douglas Hale	B.111
CARR, John Michael	L.11
CASSIE, William Fisher	B.249, B.250, B.351, G.57, J.6
CHADWICK, J.A.	L.12
CHAMBERS, Philip B.	B.56
CHAPMAN, Freddy Spencer	A.56, L.13
CHARCOT, Jean-B.	B.37
CHARLESWORTH, John Kaye	B.310
CLARINGBULL, Sir (Gordon) Frank	A.48, F.14, L.88
CLARK, Grahame	A.41
CLARK, Sir Wilfrid Edward Le Gros	E.10
COCKBURN, A. M.	B.351
COLE, Francis Joseph	B.112
COOKE, Dorothy	E.34

Index of correspondents

COOMBS, Douglas Saxon	J.20, L.14
COPE, Fred Wolverson	K.31
CORNWALL, Henry R.	F.20
COURTAULD, Augustine	B.12, B.57, B.110, B.123, L.15 See also B.21
COURTAULD, Sara R.	B.48
COURTAULD, Sir Stephen Lewis	B.272, L.15
COURTAULD, Virginia	L.15
COX, David	B.285
COX, Ian	B.106, H.100
COX, Percy Thomas	E.6
COX, Sir Percy	B.110 See also B.76
CRAGG, James Birckett	A.48
CRAWFORD, Ferdie C.	B.277, B.280, B.299
CURRALL, Arnold Edward	B.310
DAVIES, Kenneth Arthur	E.19, E.21, E.28
DAYSH, George Henry John	A.56, D.13
DEBENHAM, Frank	B.49
DEER, William Alexander	A.48, A.51, A.56, A.125, B.58, B.84, B.113, B.122, B.124, B.125, B.126, B.127, B.131, B.132, B.139, B.140, B.143, B.145, B.146, B.188, B.193, F.2, F.14, F.16, H.65, H.73, H.85, K.10, L.16 See also B.184, H.27
DEGERBOL, Magnus	B.112
DIXEY, Sir Frank James	E.19, E.21
DIXON, H.F.	E.1
DODSON, Martin Henry	E.34, E.37
DOLLAR, Archibald Thomas John	B.467, E.33, J.3, J.20, K.9
DOUGLAS, James Archibald	A.55, A.60

Index of correspondents

DOUGLAS, John A. Vibert	B.120
DRACH, Pierre	B.37
DREVER, Harald Irving	B.108, B.109, B.122, B.459, D.11, L.17 See also B.384
DRUMMOND, Sir Jack Cecil	B.78
DUFF, Sir James Fitzjames	A.39, A.43, A.48, A.51, A.53, A.54, A.55
DUNHAM, Ansel Charles	E.7, L.19
DUNHAM, Sir Kingsley Charles	A.48, A.56, B.352, B.421, B.422, B.452, E.3, E.8, H.16, K.4, K.6, L.18, L.19
DYHRENFURTH, G.O.	B.272
EAGLESHAM, Eric John Ross	A.56
EALES, Nellie B.	A.48, A.56
EDMONDS, James Marmaduke	E.11
EDWARDS, J.R. WYNNE-	A.25
EDWARDS, Wilfred Norman	B.116
EGGELING, W.J.	E.7
ELLIOT, Harry	E.23
ELLES, Gertrude Lilian	A.20, A.30, A.45
ELTON, Charles Sutherland	B.41, E.13
EMBREY, Peter Godwin	E.3, H.104, L.20
EMELEUS, Charles Henry	H.97, J.15, K.6, L.21
ERSKINE, Angus	B.470
EVANS, Bernard William	E.34
EVANS, Robert Crispin	A.56, E.16
FALCON, Norman Leslie	A.45, E.6, L.22
FARQUHAR, Oswald Cornell	B.461
FARQUHAR, Ron. M.	E.23

Index of correspondents

FAUL, Henry	E.36, E.38, L.88
FEARNSIDES, William George	A.44
FENNER, Clarence N.	B.108, B.109
FERMOR, Sir Lewis Leigh	A.48, B.108, H.52
FISCHER, Cecil E.C.	B.300
FISHER, James	B.41
FITCH, Frank	B.474
FLECK, Alexander, Baron	E.4
FLEMING, William Launcelot Scott	A.41, B.109, B.459
FLINN, Derek	B.218
FORD, Ian	H.61
FOUNTAIN, Eadric C.	B.59 See also B.103
FRASER, W.A.	L.23
FRENCH, R.B.D.	K.14
GALLAGHER, Michael John	H.16
GAME, Philip Malcolm	B.108
GARDINER, John Stanley	B.42, B.110
GARLICK, G. Donald	E.24
GARWOOD, Edmund Johnston	B.272, B.424
GASS, Ian Graham	J.22
GAULD, David T.	B.351
GÉZE, Bernard	J.10
GILETTI, Bruno J.	E.19, E.34, E.35, E.37, J.15, L.89
GLASSER, Lesley S. Dent	J.15
GLUECKAUF, Eugen	D.12
GOLDSBOROUGH, George Ridsdale	A.49

Index of correspondents

GOLDSCHMIDT, Viktor Moritz	A.41, B.8, B.106, B.108, B.345, F.2, L.89
GOODFELLOW, Basil R.	A.49, A.56, B.282, B.283, B.284
GOODMAN, Nordau Roslyn	A.56, L.89
GORDON, William Thomas	A.37
GRAHAM, Margaret	B.258
GRIFFITHS, Donald Harrison	L.89
GRIMLEY, Peter H.	B.466
GUEST, Leslie Haden Haden, 1st Baron	B.54
GUGGENHEIM, Edward Armand	A.49, A.56
GUNTHER, Albert Everard	E.5
HAANSTRA, U.	B.109
HADLEY, William Sheldon	A.17, A.25
HALLIMOND, Arthur Francis	B.108
HAMILTON, Eric Ishmael	E.27, E.37
HAMILTON, R.A.	B.461
HARKER, Alfred	A.25, B.424, L.24
HARKER, Robert Ian	B.133
HARLAND, Walter Brian	B.462, B.468, E.36, H.78, L.25
HARRINGTON, Hilary James	H.94
HARRIS, Sir Percy WYN-	L.26
HARRIS, Peter Graham	J.18, J.22, K.7, K.31
HARRISON, John Vernon	A.57, B.108, B.457
HARTOG, J.M.	B.462
HARWOOD, Henry Francis	A.45, B.106
HAWKES, Leonard	A.49, B.8, B.101, B.106, J.15, K.15, L.4
HAWKINS, Herbert Leader	A.27, A.37, A.41, A.49, B.259
HENDRIKS, Eileen Mary Lind	E.28

Index of correspondents

HENRY, Norman Fordyce McKerron	A.49, A.57, B.113, D.5, E.8
HERKLOTS, Geoffrey A.C.	B.405
HEMINGWAY, John Edwin	B.421
HERON, Alexander Macmillan	B.254, B.272
HESS, Harry Hammond	H.97, J.15, L.27
HETHERINGTON, Sir Hector James Wright	A.51
HEY, Max Hutchinson	H.74
HICKLING, Henry George Albert	A.39
HILL, Arthur S.	B.300
HILL, Robert ('Robin')	A.49, B.76, B.299, L.28
HILLS, Edwin Sherbon	L.50
HILTON, Harold	A.57
HINKS, Arthur Robert	A.32, B.12, B.52, B.274, B.275, B.276, G.25
HOBBS, William H.	A.49, A.53, B.33, B.106, B.108, B.109
HOBSON, Alfred Dennis	A.49
HOEL, Adolf	B.70, B.107, B.108
HOGARTH, Don D.	B.377
HOLLAND, Heinrich D. ('Dick')	H.33, J.15, L.29
HOLMES, Arthur	A.39, A.45, A.49, A.51, A.57, B.33, B.36, B.108, B.272, B.345, B.349, B.424, H.102, J.9, L.73 See also D.1
HOLMES, William	E.1
HOPKINS, William	D.1
HORNE, John Ewen Troup	E.33, E.34
HOUSE, Michael Robert	H.79
HOWIE, Robert Andrew	J.15
HUDSON, Robert George Spencer	F.13
HUGHES, H.	B.118
HUNT, Henry Cecil John, Baron	B.284, B.285

Index of correspondents

HUNTER, H.E.	L.91
HUTCHINSON, Arthur	A.20, A.25, A.27, B.53, B.110, B.272, L.30
HUTCHINSON, Arthur G.	L.31
HUTCHINSON, Evaline	A.29, A.57, L.30
HUTCHINSON, Leslie	A.43, A.57, A.128
HUTTON, Colin Osborne	B.405, L.32
INGERSON, Earl	H.108, J.12, L.33 See also H.101
INGOLD, C. Terence	A.41, A.49, B.259
INGOLD (née KEMP), Leonora Mary ('Nora')	A.49, B.259
IRVINE, T. Neil	H.94
IRVING, Harry Munroe Napier Hetherington	H.37
JACKSON, Everett Dale	See H.52
JACKSON, Meredith	B.1
JACOBSEN, Niels Kingo	B.105, F.15, H.22
JAEGER, J.C.	H.97
JEFFREYS, Sir Harold	B.261, J.9
JENSEN, Dungaar	B.107
JENSEN, M.A.	B.140
KAIMAN, S.	J.15
KAY, Herbert Davenport	A.49
KAY, Marshall	K.27
KAYE, Peter Hilary MARTIN-	B.405, B.408
KENNEDY, William Quarrier	F.2, J.17, J.20, J.21, K.7, K.31
KENT, Sir Peter (Percy Edward Kent)	B.109

Index of correspondents

KING, Margaret G.	A.53, L.34
KING, William Bernard Robinson	A.30, A.37, A.39, A.41, A.44, A.49, A.53, A.54, A.55, B.132, B.272, L.34
KIRWAN, Sir (Archibald) Laurence (Patrick)	B.282, B.456, B.463, B.472
KOCH, Lauge	B.12, B.27, B.47, B.108, B.114, B.126 See also B.125
KROGH, Thomas E.	E.24
KROKSTRÖM, T.	L.4
KUENEN, Philip Henry	H.100
KULP, J. Laurence	E.34, L.35 See also H.61
KUNO, Hisashi	J.11, J.13, L.36
LACLAVERE, Georges	J.11, J.12, J.13, J.16
LACROIX, Alfred	B.108
LAMB, Herbert H.	L.37
LAMBERT, Richard St John	E.34, E.35
LANHAM, Arthur N.	E.16
LARKUM, Anthony	J.20
LAWRENCE, Thomas Edward	See SHAW, T. E.
LEAKE, Bernard Elgey	B.345, E.29, K.3, L.38
LEES, George Martin	B.109, F.2
LEWIS, W. Vaughan	B.461
LISTER, H.	B.124
LOMBAARD, Ben V.	H.74, L.39
LONG, Leon E.	E.37
LONGLAND, Sir John Laurence	A.57, B.60, B.253, B.277, L.40 See also B.102
LONGSTAFF, Thomas George	A.49, B.273, B.275, B.277, B.278, L.41

Index of correspondents

LUNDEGARDH, Per H.	F.19 See also F.29
LYTH, Philip	A.57
McBURNEY, Charles B.M.	B.456
McCALLIEN, William John	B.345
MACDONALD, Gordon A.	H.11, L.42
MACFADYEN, William Archibald	B.351, B.366, E.7
MACGREGOR, Archibald Gordon	A.45, A.49, B.367, B.405, F.23, J.11
MACGREGOR, Malcolm	B.108, B.362, B.391
McINTYRE, Donald Bertram	J.6
MACKENZIE, William Scott	H.85
MALCOLM, A.D.	B.281
MALING, Derek H.	D.12
MANLEY, Gordon	A.41, B.104, B.272, B.284, B.351
MANLEY, H.	L.43
MARFUNIN, A.S.	J.25
MARQUAND, C.V.B.	B.300
MARR, John Edward	A.20, A.25, A.27
MARSHALL, A.J.	B.457
MASCALL, Eric Lionel	A.57
MASON, Kenneth	B.271
MATHIESON, Sir John	B.1
MATTHEWS, J.R.	A.41, F.2
MAYNE, Kenneth I.	H.61
MERRICK, Hugh	B.285
MIALL, Edith E.	A.57
MIALL, Leonard	A.49

Index of correspondents

MIALL, Rowland	A.41, A.53, A.57
MIKKELSEN, Aksel	L.44
MIKKELSEN, Ejnar ('Mikki')	B.23, B.29, B.31, B.71, B.72, B.110, B.122, B.124, G.28, L.45
MIKKELSEN, Sven	B.28
MILLER, A. Austin	B.269
MILLER, John A.	H.106
MITCHELL, George Francis	K.14
MITCHELL, George Hoole	B.352
MITCHELL, James	B.344
MITCHELL, Robert Lyell	F.6, F.14, F.15, F.33, H.11, H.81, H.108, K.16, L.46
MOORBATH, Stephen Erwin	E.24, E.30, E.34, E.35, H.106, J.15, J.16 See also E.18, H.59
MOORE, Leslie Rowsell	L.47
MORSE, S. Antony	L.48
MUIR, Alex	J.1
MUIR, Ian Douglas	B.117, F.28
MULLER, Leonard D.	E.17, H.33
MUNCK, Ebbe	B.124, B.127, B.145
MURTHY, Mysore Venkata Narayana	L.91
NATURE CONSERVANCY	E.7
NEEDHAM, Joseph	L.28
NEL, Louis Taylor	K.16
NEUMANN, Henrich	A.58, B.33, F.17, L.49, L.55
NICHOL, Ian	E.3
NICHOLAS, Tressilian Charles	A.34, B.272, B.345
NICHOLLS, Geoffrey Dennis	B.146, L.50
NIELSEN, Niels	B.105

Index of correspondents

NOCKOLDS, Stephen Robert	A.40, A.45, A.49, A.58, F.14, F.15, F.30, H.11, H.51, H.106, K.4, L.76
NOORDEN, Stanley B. VAN	A.21
NORLUND, N.S.	B.74, B.135
NYGAARD, Arne NOE-	B.114, B.122, B.124, B.193, G.70, L.51, L.52
OAKLEY, Kenneth Page	B.109
ODELL, Noel Ewart	A.58, B.54, B.109, B.258, B.272, B.278, H.81, L.53
OGG, Sir William Gammie	F.5, J.1
ONIONS, A.B.	A.60
OSTROVSKY, Igor A.	J.25
PARKES, George David	E.2
PARRY, James Hywell	B.128
PASCAL, Roy	A.58, L.54
PATCHING, S.W.F.	E.16, E.17
PATTERSON, Edward Mervyn	B.310
PAULY, Hans	H.104
PEACOCK, James Douglas	B.461
PEOPLES, Joe Webb	B.114
PERCY, Eustace, 1st Baron	A.43, K.15
PEREZ, Michel	B.114
PHEMISTER, James	B.101, E.37, J.9
PHILLIPS, Frank Coles	E.8 See also B.315
PHILLIPS, Roy	F.18, H.33, L.55
PICKERING, Sir George White	A.29, A.46, A.51, L.56
PITCHER, Wallace Spencer	L.57
PLASKETT, Harry Hemley	K.27

Index of correspondents

POLDERVAART, Arie	H.97, L.58
POLUNIN, Nicholas	A.49
POTTER, George J.R.	E.1
PORSILD, Morten P.	B.106
PRIESTLEY, Sir Raymond Edward	B.6
PUGH, William John	A.58, B.132
PYE, Sir David Randall	A.46, A.47
RAGUIN, Eugène Paul Antoine Jacques	J.4
RAISTRICK, Arthur	K.15
RAMDOHR, Paul	H.33
RANDS, Claud Norris	B.109, D.12
RASMUSSEN, Knud Ellitsgaard	B.472, L.51, L.59
RASTALL, Robert Heron	A.42, B.452, F.13 See also L.86
RAYNER, Dorothy Helen	B.421
READ, Herbert Harold	A.37, A.46, B.106, B.108, B.344, B.424, E.21, E.36, F.2, J.23
REILLY,	A.58
REYNOLDS, Sidney Hugh	B.424
RICHARDS, Adrian F.	B.409
RICHEY, James Ernest	A.37, A.39, A.42, A.45, A.58, B.106, B.112, B.135, B.349, B.364, J.6, J.9, J.10, J.11, J.13, J.14, J.17, L.60
RICHTER, Derek	H.108
RICKARD, Trixie	A.58
RILEY, N.D.	B.111
RILEY, Quentin	A.125
ROBERTS, Brian	B.28, B.135
ROBERTS, Sir Sydney Castle	A.58

Index of correspondents

ROBINSON, S.C.	J.15
ROBSON, Geoffrey Robert	B.405, J.13, L.61-L.63
ROOTS, Fred	L.90
ROSBAUD, Paul	H.61, H.108
ROSE, Grahame N.	H.52
ROSENKRANTZ, Alfred	B.28, B.121, B.122
ROYAL SOCIETY	J.7-J.27
RUCKLIDGE, John C.	B.472
RUNCORN, Stanley Keith	B.118
RUNNER, Joseph J.	D.12
RUSSELL, Sir Arthur Edward Ian Montagu	L.65 See also L.18
RUSSELL, Sir (Edward) John	K.26
RUSSELL, R. Dan	J.9
RUSSELL, R. Scott	A.125
RUTTLEDGE, Hugh	A.58, B.76, B.253, B.260, B.273, B.275, B.277, L.64
SAHNI, M.R.	L.90
SANDFORD, Kenneth Stuart	A.42, A.45, A.54, A.60, B.109, B.272, B.462, B.472, L.66
SCHONLAND, Sir Basil Ferdinand Jamieson	E.21
SCHÜRMAN, Heinrich Moritz Emil	E.36
SCOTT, James M.	B.11, B.113, B.252, B.258, B.279 See also B.10
SEWARD, Sir Albert Charles	A.25, B.43, B.50, B.110, B.116, L.67 See also B.27
SEWARD, Mary Adelia, Lady	L.67
SEWARD, Walter	L.28
SHACKLETON, Edward Arthur Alexander, Baron	E.12

Index of correspondents

SHACKLETON, Robert Millner	B.218, J.13, K.8, L.93
SHAND, S. James	B.108, F.20
SHAW, Sydney Herbert	B.405, E.19, J.11, J.13, L.62
SHAW, Thomas Edward	L.22
SHIMAZU, Yasuo	L.68
SHIPTON, Eric Earle	B.277, B.283, L.69
SHOTTON, Frederick William	A.45, B.409, B.462, D.8, D.12, K.2, K.26, L.8
SHROCK, Robert R.	L.2, L.50
SIBLY, Sir Thomas Franklin	A.27, A.30, A.34, A.37, A.39, A.42, A.45, A.50, B.5, B.39, B.54, B.108, B.253
SIGNORE, Francesco	A.64
SILVER, Leon T.	L.93
SIMPSON, D.H.	B.109
SIMPSON, James W. Courtauld	B.124, B.461
SIMPSON, John Hope	A.50, A.59, A.60
SLATER, Sir William Kershaw	J.1
SLAWSON, W.F.	E.37
SMALES, Albert Arthur	B.215, B.220, E.17, E.21, H.33, H.61, H.108
SMIT, Jan Van R.	H.37
SMITH, Joseph Victor	B.120
SMITH, Walter Campbell	A.30, A.45, B.109, H.20, L.65, L.70
SMITHERINGALE, W.G.	L.91
SMYTHE, Frank Sydney	A.29, B.275, B.277
SMYTHE, J.A.	B.424
SOLLAS, William Johnson	B.344
SØRENSEN, Henning	L.51, L.71
SPENCER, Leonard James	F.14
SPENDER, Michael A.	A.34, B.23, B.26 See also M.101

Index of correspondents

SPILLER, Reginald Charles	A.59, A.60
STEFANSSON, Vilhamur	B.31, B.33
STEPHENSON, Alfred	A.50, A.59, B.135
STEWART, Alexander Boyd	F.7
STEWART, Sir Frederick Henry	A.40, B.352, H.78 See also D.20
STRUTT, E.L. ('Bill')	B.277
STUBBLEFIELD, Sir (Cyril) James	A.45, E.30
SUTTON, John	B.405, B.408, E.29, L.74
SWINNERTON, Henry Hurd	B.116
TAYLOR, Sir Geoffrey Ingram	A.59, B.124, L.75
TAYLOR, Stuart Ross	H.61
TEICHERT, Curt	B.106, B.109, D.12, L.53
THOMAS, Herbert Henry	A.30, B.11, B.106
THOMAS, M.B.	B.473
THOMAS, R. Grenfell	F.19
THORARINSSON, Sigurdur	B.128
TILLEY, Cecil Edgar	A.37, A.40, A.42, A.45, A.46; A.51, A.54, B.54, B.101, B.115, B.124, E.16, F.19, H.11, H.57, H.76, H.100, H.102, H.103, K.13, K.26, L.76
TILMAN, Harold William	B.459
TOIT, Alexander Logie DU	B.108
TOMBLIN, John Frederick	B.408
TOMKEIEFF, Sergei Ivanovitch	B.108, B.311, J.11, J.13, J.19, J.23, L.77
TREVELYAN, George L.	B.8, L.78
TRUEMAN, Sir Arthur Elijah	A.46, A.50, A.51
TUNSTALL, Norman	B.118
TURNER, John Selwyn	B.421

Index of correspondents

TUTTLE, Orville Frank	L.79
TYRRELL, George Walter	B.1, B.37, B.108, B.113, B.272, B.355
ULRYCH, T.J.	E.24
UPTON, Brian Geoffrey Johnson	A.67, J.20
VALENTINE, David Henriques	A.50
VEALE, Sir Douglas	A.55
VERSEY, Henry Cherry	B.421, B.424, L.93
VINCENT, Ewart Albert ('David')	A.67, B.202, B.219, E.3, E.19, E.34, F.28, H.74, L.80 See also B.120, B.210, B.211, B.212, B.213, B.215, B.216, B.220, B.412, D.22, E.17
VINOGRADOV, A.P.	J.25
VUAGNAT, Marc	A.64
WADDINGTON, Conrad Hal	L.81
WADSWORTH, Wilfred John	J.15
WAGENSTAFF, John Edward Pretty	A.59
WAGER, Bid	A.59
WAGER, Elizabeth ('Kit')	A.59, L.82
WAGER, Harold	A.19
WAGER, Harold Geoffrey ('Hal')	A.19, A.42, A.50, A.53, A.59, B.22, B.61, B.128, F.2, L.82
WAGER, Morton Ethelred	A.18
WAGER, Nessie	A.59
WAGER, Phyllis Margaret	A.67, B.37, B.96, H.95 See also B.65, B.66
WAGER, Winifred	A.42
WALDER, Phoebe Selina	A.42, A.50, A.59, B.109 See also B.303

Index of correspondents

WALKER, Frederick	B.108, K.16
WALKER, George Patrick Leonard	B.311, J.18, J.22
WALKER, Sir Gilbert Thomas	B.299
WALKER, T.	F.20
WALSH, R.C.	L.90
WALTON, John	A.51
WARREN, Charles B.M.	B.258, B.278
WASSENSTEIN, Benno	K.16
WATKINS, Henry George ('Gino')	B.2, B.4
WATTS, William Whitehead	B.108
WEBSTER, Ronald K.	E.35
WEISS, L.E.	B.461
WELLS, Maurice Kingsley	B.109, L.83
WESTERMANN, J.B.	B.408
WESTOLL, Thomas Stanley	A.45, A.50, D.11, K.17, L.84
WHIPPLE, Francis John Welsh	B.262
WHITTARD, Walter Frederick ('Whit')	A.39, A.42, A.43, A.45, A.50, A.59, A.60, B.8, B.24, B.108, B.126, D.2, E.28, L.85
WILLIAMS, David	L.90
WILLIS, Sir Algernon	B.461
WILLS, Leonard Johnston	B.458
WILSON, Gilbert	B.108, B.109, E.37
WILSON, H.D.B.	H.36
WILSON, John Tuzo	B.409, J.9, J.11, J.12
WILSON, N.W.	H.52
WILSON, W.J.	D.12
WINCHESTER, Simon B.A.	B.472
WISEMAN, John Douglas Holt	D.12

Index of correspondents

WOOD, Alan	H.8
WOOD, Helen Margaret MUIR-	B.271, B.272
WOODS, Henry	A.50, A.59
WOODWARD, Sir Henry Smith	L.86
WOOSTER, William Alfred	K.15
WORDIE, Sir James Mann	A.22, A.34, B.1, B.25, B.44, B.110, B.122, B.461, D.13, J.12, L.87 See also B.27
WORSWICK, George David Norman	E.2
WORTHINGTON, A.E.	A.42, A.45
WORTHINGTON, Edgar Barton	A.40, A.50, B.24, B.45, B.54, B.76, B.111, B.112, E.7
WORTHINGTON, Jane Florence	A.59
WYLLIE, Peter John	L.93
YODER, Hatten S.	B.118, H.72, L.11
YORK, Derek	E.23
YOUNG, Geoffrey WINTHROP-	A.59