

THE ROYAL SOCIETY

THE ROYAL COMMISSION ON HISTORICAL MANUSCRIPTS

Committee on Scientific and Technological Records

CONTEMPORARY SCIENTIFIC ARCHIVES CENTRE

Papers of

Professor DAVID KEILIN, F.R.S.

(1887 - 1963)

Listed by: Jeannine Alton

Harriot Weiskittel

Description of the collection

The papers cover the years 1867 - 1963.

They were received from Mrs. Joan Whiteley (daughter), who retains during her lifetime the biographical material listed as Items 1 - 6.

Professor Keilin was of Russian-Jewish extraction brought up in Warsaw. He was a student at the Sorbonne and began his scientific work in Paris before moving to Cambridge; his cosmopolitan background is reflected in the many foreign languages used in his notebooks, publications and correspondence, which are noted in the handlist.

Professor Keilin began his scientific career as an entomologist and parasitologist, and retained his interest in these subjects throughout his working life in addition to his developing concentration on the biochemistry of cell respiration. For this reason it has not always been possible to date working papers precisely. He suffered from asthma and travelled little; this, together with the very wide range of his scientific interests, was responsible for his extensive correspondence.

The collection includes material belonging or relating to other scientists, for example Dr. C.A. MacMunn, an early and neglected precursor of Keilin's work on cytochrome; there are also correspondence and drawings of Sir Ronald Ross and Professor G.H.F. Nuttall, Keilin's predecessor as Quick Professor of Biology and Director of the Molteno Institute, Cambridge University (Items 223 - 228).

The numerous drawings, especially of parasitological subjects, are by Nuttall, Keilin and perhaps others. The high quality of the execution has been thought justification for retaining them (Items 220 - 222, and 229).

Material relating to the Royal Society, the Agricultural Research Council, and the Chemical Defence Research Department, Ministry of Supply, has been returned to the appropriate authorities.

A selection of books from Keilin's library, and much of his large collection of off-prints, are in the library of the Department of Zoology, Oxford University.

Summary of the career of Professor Keilin

- b. 1887 Moscow
- 1897 - Educated at Górski Gymnasium, Warsaw
1904
- 1904 Liège University
- 1905 Paris University
Began work with Maurice Caullery in Laboratoire d'Evolution des
Etres Organisés, Paris, on Pollenia Rudis
- 1913 Married

Summary of career (cont)

- 1914 D.Sc. (Sorbonne)
Prix Passet, Société entomologique de France
- 1914 - 23 Work on morphology and biology of protists
- 1915 Invited to Cambridge to work with G.H.F. Nuttall, Quick
Professor of Biology
Work on Pediculus humanus
- 1920 - 25 Beit Memorial Research Fellow, Cambridge
- 1920 Began work on cellular respiration using mainly spectroscopic
methods
- 1921 Moved with Nuttall to Molteno Institute for Research in Parasitology,
Cambridge
- 1925 University lecturer in Parasitology, Cambridge
Work on cytochrome published
- 1928 Fellow of the Royal Society
- 1931 - 52 Quick Professor of Biology and Director of the Molteno Institute;
Professorial Fellow, Magdalene College
- 1934 Croonian Lecturer, Royal Society
- 1934 - 63 Editor, Parasitology
- 1934 Work on enzymes, collaborating principally with E.F. Hartree (1934-58)
and T. Mann (1937-44)
- 1939 Royal Medal, Royal Society
- 1946 Work on Anabiosis
- 1952 Copley Medal, Royal Society
- 1955 Membre Associé Etranger, Académie des Sciences, Paris
- 1957 Honorary Fellow, Magdalene College, Cambridge
- 1958 Leeuwenhoek Lecture, Royal Society

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*Biographical and scientific material relating to Dr. C.A. MacMunn,
Sir Ronald Ross, Professor G.H.F. Nuttall

Handlist

- I. Biographical material (Items 1 - 6 retained by Mrs. Joan Whiteley,
c/o Jesus College, Oxford)
1. Miscellaneous memoirs - Royal Society, Parasitology, Biochemical Journal, Enzymology.
 2. Diary of Mrs. Anna Keilin. 1921 (Polish), 1947 (English)
 3. Autograph book of Mrs. Anna Keilin (Polish)
 4. Four packets of private family letters, mainly in Polish, some French and English, numbered I - IV
 5. 2 sets of Cambridge University diaries
 6. Green wallet file concerning Molteno Institute 1906 - 63. (Keilin died 27 February 1963 at a meeting to discuss the Molteno)
 7. Miscellaneous photographs of Professor Keilin, his laboratories, and his associates, dated and identified when known.
 8. Miscellaneous letters and newspaper clippings (1 letter in Polish)
 9. Miscellaneous letters and documents including naturalisation papers.
 10. Miscellaneous souvenirs of Royal Society tercentenary celebration in Cambridge

11. Miscellaneous correspondence of Anna Keilin.
12. Miscellaneous epigraphs collected by Keilin.
13. Letter 1915, from J. Stanley Gardiner inviting Keilin to Cambridge. Correspondence in French and English 1914 -- 16 relating to offer of job with U.S. Department of Agriculture.
14. Miscellaneous letters of sympathy written by Keilin.
15. Magdalene College, Cambridge: dinners and guests.
16. Magdalene College, Cambridge: letter of election to Research Studentship 1916; correspondence with Master and President; Pepys Library Appeal.
17. Autobiographical notes during illnesses. 1960 - 61
18. Miscellaneous private correspondence: mainly letters of congratulations to and from Keilin (in English, French, Polish, Chinese.)
19. Certificates: D.Sc. (Sorbonne) 1918; M.A. Cambridge 1923.
20. Certificate: Liège 1951
21. Certificate: Polish Academy of Sciences 1959
22. The Copley Medal 1951
23. The Royal Medal 1939
24. Honours, appointments and awards (in English and French)

Société entomologique de France	1911
Prix Passet (see also 107, 141)	1915
Royal Society	1928
Membre Correspondant, Société de Biologie, Paris	1928
Election to Quick Professorship	1931
Medical Research Council	1942
Letters <u>re</u> Royal Medal	1939
Honorary Doctorate, Brussels	1947
Académie des Sciences, Institut de France	1947 & 1955
Honorary Doctorate, Bordeaux	1947
Letters <u>re</u> Copley Medal	1951
25. Honours and awards (in English and French)

Letters <u>re</u> Liège	1952
Letters <u>re</u> nomination for Nobel Prize	1953 - 54
Honorary Doctorate, Bologna	1954
Letters and Certificate, Académie des Sciences, Institut de France	1955
26. Honours and awards (in English, French, Italian, Dutch)

Letters <u>re</u> Doctorate, Utrecht	1956
St. Vincent Prize, Turin	1957
Letters <u>re</u> Polish Academy of Sciences	1959
Foreign Honorary Member, American Academy of Arts and Sciences	1959
New York Academy of Sciences (declined)	1960
American Society of Biological Chemists	1961
British Society for Parasitology	1962
Royal Society of the Arts (declined)	1952
27. Obituaries and letters of sympathy. Letters re Keilin Memorial Lecture

II. Address books

- 28 - Miscellaneous address books of scientific correspondents.
32.

III. Bibliographies

- 33 - 6 looseleaf notebooks, annotated bibliography (in English,
38. French, German).
- 39 - 2 sheaves of unbound bibliographies on parasites (in English,
40. French, German).
41. Looseleaf notebook, bibliography (in English, French, German).
42. Card-index bibliography.
43. Sheaf of bibliographical cards (in English, French, German).
44. Wallet file of miscellaneous annotated bibliographies (in English,
French, German).
45. Sheaf of bibliographical cards (in English, French, German).

IV. Working notebooks

46. Sheaf of cards describing field excursions and observations. 1911
47. Ms. notebook (in French, German). 1908
48. Ms. notebook, Paris (in French, English, German). ?1910
49. 2 notebooks of observations on larvae, Paris (in French). 1911 - 15
50. Ms. notebook, Paris (in French). 1913 - 15
51. Ms. notebook on larvae (in French). 1915 - 17
52. Ms. notebook on larvae (in French, German, Polish, English). 1915 - 18
53. Ms. notebook on larvae (in French, English, German). 1921 - 24
54. Ms. notebook on haematin and porphyrin. 1925 - 26
55. Ms. notebook on miscellaneous biochemical experiments
(Keilin, Hartree, Mann and others). 1926 - 40
56. Ms. notebook on cytochrome and other experimental observations
(Keilin and Hartree). 1929 - 42
57. Ms. notebook on biochemical observations. 1930
58. Ms. notebook on oxidases (in English, French, German). 1930 - 33

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|-----|--|------------|
| 59. | Ms. notebook on haemoglobin and spectroscopy observations. | 1930 - 33 |
| 60. | Ms. notebook inscribed 'Respiration of <i>Gastrophilus</i> . Y.L. Wang.' | 1934, 1945 |
| 61. | Ms. notebook on cytochrome observations. | 1934 |
| 62. | Ms. notebook II 'Reversion Spectroscopy. Peroxidase. Apo-zymase and Co-zymase. T.Mann' (in English, German, and Polish). | 1935 - 36 |
| 63. | Ms. notebook (Hartree) 'Reconstruction of Hexosemonophosphoric system.' | 1936 |
| 64. | Ms. notebook (Hartree) 'Methaemoglobins and Haemoglobin with nitrate.' | 1936 - 54 |
| 65. | Ms. notebook (Hartree) 'Catalase.' | 1936 |
| 66. | Ms. notebook 'III Peroxidase. T. Mann.' | 1936 - 38 |
| 67. | Ms. notebook 'I Polyphenoloxidase. T. Mann.' | 1937 |
| 68. | Ms. notebook 'II Polyphenoloxidase. T. Mann' (in English, German) | 1937 |
| 69. | Ms. notebook (Hartree) 'Insoluble enzymes of heart-muscle etc. bacteria' | 1937 - 39 |
| 70. | Ms. notebook (Hartree) 'Oxidation systems.' | 1937 |
| 71. | Ms. notebook (Hartree) 'Catalase II.' | 1937 - 43 |
| 72. | Ms. notebook 'III Polyphenoloxidase. T. Mann' (with Ms. notes by Keilin). | 1938 - 39 |
| 73. | Ms. notebook (Hartree) 'Coupled oxidation,' 'Notatin' | 1938 - 46 |
| 74. | Ms. notebook (Hartree) 'Insoluble enzymes of heart muscle etc.' | 1939 |
| 75. | Ms. notebook (Hartree) 'Insoluble enzymes of heart muscle etc.' | 1939 - 42 |
| 76. | Ms. notebook 'IV Polyphenoloxidase. T. Mann.' | 1939 - 44 |
| 77. | Ms. notebook 'IV Peroxidase. T. Mann' (Mann and Keilin) | 1940 |
| 78. | Ms. notebook (Hartree) 'Spectroscopy.' | 1940 - 49 |
| 79. | Ms. notebook (Keilin and Hartree) 'Catalogue of Parasitic Bacteria'; also biochemical experiments. | 1940 - 42 |
| 80. | Ms. notebook (Hartree) 'Yeast and Bacteria, Vol. I' | 1940 - 46 |
| 81. | Ms. notebook (Hartree) 'Yeast and Bacteria, Vol. 2' | 1946 - 48 |
| 82. | Ms. notebook (Hartree) 'Insoluble Enzymes of heart muscle' | 1942 - 45 |
| 83. | Ms. notebook (Hartree) 'D.S.I.R.' | 1941 - 42 |
| 84. | Ms. notebook 'Different Observations' by Keilin, Dr. Joan Keilin, E.F. Hartree. | 1943 - 48 |

85. Ms. notebook (Hartree) 'Notatin (applications)' 1945 - 51
86. Ms. notebook (Hartree) 'Succinic Cytochrome Vol. 6' 1946
87. Ms. notebook on miscellaneous biochemical observations. 1947 - 57
88. Ms. notebook on miscellaneous experiments with yeast. 1950
89. Ms. notebook (Keilin and Hartree) 'Peroxidase Catalase, vol.7' 1954 - 55
90. Ms. notebook (Hartree) 'Glutathione Uricase Xanthinoxidase' 1956
91. Ms. notebook (unidentified) on miscellaneous experiments 1957
92. Ms. notebook (unidentified) on miscellaneous experiments 1957 - 58
93. Ms. notebook on 'Manometric Experiments.' 1958 - 59
94. Ms. notebook (unidentified) on experiments. 1958
95. Ms. notebook on hemerythrin. Urechrome. 1958 - 59
96. Ms. notebook of parasitological drawings. Early work? (French) n.d.
97. Ms. notebook on oxidases (in English, German, French) n.d.
98. Ms. notebook (Hartree) biochemical notes n.d.
99. Ms. notebook on cytochromes and enzymes n.d.
100. Ms. notes 'Experiments' (Parasitology) n.d.
101. Ms. notebook 'Respiratory Carriers and Enzymes' n.d.
102. Ms. notebook (Keilin and Mann) notes on books and journals read (in English, German). n.d.
103. Ms. notebook on metalloporphyrins and haematin n.d.
104. Box file 'Cytochrome and other haemoproteins' (Manuscript and typescript) n.d.
105. Box file 'Laccase'; bibliographies, correspondence, offprints, articles, Ms. draft on laccase by T. Mann. (in English, French) 1939
106. Box file 'Cytochrome and other haemoproteins' (manuscript notes and corrected typescript.) n.d.
107. Box file 'Old Mss.'
3 envelopes. 'Recherches sur les larves de Diptères cyclorhaphes: 1915 I Cycle évolutif de Pollenia rudis.' Manuscript, notes, errata. (Awarded Prix Passet 1914. See also nos. 24, 141) (French)
'Cytochrome and Respiratory Enzymes.' Proceedings of the Royal Society B, 104, 206-252. Typescript with Ms. corrections and additions. 1929
108. Miscellaneous biochemical notes, bibliographies and working papers (in English, French, German) n.d.

109. 'Caulleryella myiatropa' (Keilin and Ehatia) notes, drawings, Ms. draft. (in English, French, Portuguese) n.d.
110. Miscellaneous working papers on parasitology and respiration (in English, French, German) n.d.
111. Ms. notes and drawings on various parasites, malaria n.d.
112. 'Aseptic life literature' notes (early work perhaps assembled later for work on Anabiosis) (in English, French) n.d.
113. 'Physiology of respiration in insects,' miscellaneous notes, draft, bibliography of paper. (in English, French, German) n.d.
114. Larvae and respiration in insects. Miscellaneous notes and drawings. (mainly in French) 1910 - 44
115. Early work on parasitology in London and Cambridge, drawings, notes and scientific correspondence (in English, French) n.d.
116. Notes on classification of larvae, Paris (French) n.d.
117. Miscellaneous notes and working papers on larvae; Paris and Cambridge. (in French and English) n.d.
118. Symbiosis. Notes and working papers (perhaps for lecture) n.d.
119. Spectroscopic drawings and observations. n.d.
120. Miscellaneous notes and working papers, biochemical c.1955
121. Miscellaneous notes and working papers. Enzymes and haemo-proteins n.d.
122. Miscellaneous notes and working papers. Enzymes and haemo-proteins n.d.
123. Experiments and notes on role of catalase 1958
124. Laboratory observations and graphs 1959 - 60
125. Miscellaneous working papers: immunity, cytochrome n.d.
126. Miscellaneous notes and working papers: biochemistry n.d.
127. Miscellaneous notes and working papers: biochemistry n.d.

V. Cambridge University

128. Lecture on Symbiosis n.d.
129. Miscellaneous lecture notes: metallo-protein compounds; peroxidase, dehydrogenase, carbonic anhydrase, porphyrin n.d.
130. Lecture on porphyrin n.d.
131. Lecture on cellular respiration n.d.
132. Lecture on bile pigments n.d.

133. Lecture on haemoglobin n.d.
134. Notebook: lectures on parasitology, protozoa, and helminths 1933
135. Notebook: lectures on cytochrome n.d.
136. Notebook: lectures and demonstrations 1956 - 57
137. Notebook: lectures on oxidases n.d.
138. Notebook: examination questions n.d.
139. Reports of Quick Professor and Molteno Institute 1932 - 58
140. Syllabus, reading lists, practical experiments, lecture abstracts n.d.

VI. Publications

141. 'Recherches sur les larves de Diptères cyclorhaphes,' Bulletin scientifique de la France et de la Belgique, 1915. Awarded Prix Passet, Société entomologique de France, 1914. (see also 24, 107) (in French). Manuscript 1915
142. 'On cytochrome, a respiratory pigment common to animals, yeast and higher plants,' Proceedings of the Royal Society B, 98, 312-339, 1925. 2 typescripts with Ms corrections. 1925
143. 'Parasitology,' Encyclopaedia Britannica, 14th edition, 17, 276-280, 1929. Typescript with Ms corrections 1929
144. 'Cytochrome and respiratory enzymes,' Proceedings of the Royal Society B, 104, 206-252, 1929. 2-page outline 1929
145. 'Mechanisms of cellular respiration,' Croonian Lecture, The Royal Society, 1934. Drafts with Ms corrections 1934
146. 'Respiratory systems and respiratory adaptation in larvae and pupae of Diptera,' Parasitology, 36, 1-66, 1944. Notes and drafts 1944
'Haemoglobin of Gastrophilus larvae,' (with Y.L.Wang), Biochemical Journal, 40, 855-866, 1946. Notes and drafts. 1946
'Stability of haemoglobin and of certain endoerythrocytic enzymes,' (with Y.L. Wang), Biochemical Journal, 41, 491-500, 1947. Notes and drafts. 1947
147. Work on blood formation (1946 - 54): correspondence with Dr. S.H. Wajda and Sir Solly Zuckerman; comments on review of Wajda's Ms. and published work, with Ms. and corrected typescript; related offprints by Wajda, Whitby and others; miscellaneous notes. (in English, Japanese) 1946 - 54
148. Work on enzymes 1940 - 51
'Carbonic anhydrase. Purification and nature of the enzyme,' (with T. Mann), Biochemical Journal, 34, 1163-1176, 1940. Notes and drafts. 1940
'Specificity of glucose-oxidase (notatin)' (with E.F. Hartree) Biochemical Journal, 50, 331-341, 1951. Draft and notes. 1951

148. 'Purification of horseradish peroxidase and comparison of its (cont) properties with those of catalase and methaemoglobin,' (with E.F. Hartree), Biochemical Journal, 49, 88-106, 1951. Ms notes and draft 1951
'Cytochrome oxidase and the "Pasteur enzyme,"' (with E.F. Hartree), Nature, 171, 413, 1953. Ms draft 1953
149. 'Biological catalysis of mutarotation of glucose,' (with E.F. Hartree), Biochemical Journal, 50, 341-348, 1951. Proof with Ms corrections, drawings. 1951
150. Work on nomenclature of cytochromes: correspondence, papers and comments. 1953 - 54
151. 'The aerobic oxidation of dihydroxyfumaric acid in presence of peroxidase,' (with E.F. Hartree), Ms notes and drafts for article 1954 - 58
152. Work on cyanide: Ms notes and bibliographies c.1955
153. 'Distribution and diversity of haemoglobin,' Acta Biochimica Polonica, 3, 439-457, 1956. Ms notes, drafts, typescript with Ms corrections. 1956
154. 'Reactions of catalase with hydrogen peroxide and hydrogen donors,' (with P. Nicholls), Biochim. Biophys. Acta, 29, 302-307, 1958. Manuscript, experimental results, typescript with Ms corrections 1958
- 155.- 'The problem of anabiosis or latent life,' The Leeuwenhoek 1959
157. Lecture, The Royal Society, 1958. Ms notes, working papers, drafts, bibliographies, correspondence, proofs with Ms corrections, 1st typed draft, printed copy. (in English, French, German, Italian)
158. 'Effect of inhibitors on the activity of soluble succinic dehydrogenase and on the reconstitution of the succinic dehydrogenase-cytochrome systems from its components,' (with Tsao E. King), Proceedings of the Royal Society B, 152, 163-187, 1960. Correspondence, Ms notes, proof with Ms corrections. 1960
159. 'Haemerythrin,' Acta Biochimica Polonica, 7, 415-424, 1960. Ms drafts, annotated bibliography, notes, calculations, reprints and related correspondence. (in English, French, German) 1960
160. 'The problem of language in publications of works of scientific and other fields of learning,' Nature, 186, 912, 1960. Ms drafts, notes, bibliography and correspondence. 1960
161. 'Maurice Caullery 1868-1958,' Biographical Memoirs of Fellows of the Royal Society, 6, 13-31, 1960. Ms notes, correspondence, proof with Ms corrections. (in English, French) 1960
162. Work on cyanide. Ms drafts, notes; annotated bibliographies, correspondence, and related offprints. (in English, German) 1961 - 63

163. 'Reactions of haemoproteins with hydrogen peroxide and the supposed formation of hydrogen peroxide during the autoxidation of haemoglobin,' Nature, 191, 769-770, 1961. Manuscript, laboratory observations (in another hand), proof with Ms corrections. 1961
164. 'Metabolism of haemoglobin and haematin compounds in Ascaris Lumbricoides,' (by M.H. Smith and D.L. Lee). Keilin's discussion of paper, correspondence. 1962
165. 'Absorption spectra and some other properties of cytochrome c and of its compounds with ligands,' (with W.D. Butt), Proceedings of the Royal Society B, 156, 429-458, 1962. Ms notes, report by Butt. 1962
166. Miscellaneous reviews of books and papers: Ms notes and drafts n.d.
- 167.- 'The History of Cell Respiration and Cytochrome,' Cambridge University Press, 1964. Ms notes and drafts, typescripts with Ms corrections. (in English and German) 1964
- 170.
171. Parasitology: correspondence with Cambridge University Press on editorial matters 1933 - 62
- 172.- Parasitology: correspondence with authors and referees 1933 - 62
175. 172. Articles numbered by Keilin 1139 - 1219
173. " " " " 1221 - 1231
174. " " " " 1232 - 1253
175. " " " " 1255 - 1294

VII. Conference

176. International Union of Biochemistry Symposium, Canberra, 6 and 7 September, 1959. Correspondence, reports, Ms comments on cytochrome nomenclature, sub-commission meetings reports. 1959

VIII. Correspondence

177. Miscellaneous correspondence with colleagues in other countries (in French, German, Polish, Russian) 1911 - 38
178. re: protozoa (in English, French, Italian) 1921 - 24
179. re: sample analyses
- 180.- Files of scientific correspondence arranged alphabetically
199. according to correspondent. See Index, page 13. (in English, French, German, Russian, Polish)
200. Correspondence re grants for Keilin's early work (including letters from Nuttall to Royal Society and M.R.C.); Keilin's application for Quick Professorship. 1918 - 31
201. Correspondence of Keilin and Nuttall with Sir James Fowler re Beit Memorial Fellowship; Keilin's annual reports on work. 1920 - 26

202. Correspondence with Sir Edward Mellanby re: M.R.C. grant; with Sir Henry Dale re: personal grant from Wellcome Trust, Keilin's annual reports on work. 1947 - 61
203. Correspondence re: continuing research grants from Nuffield Foundation 1951 - 55
204. Correspondence re various articles written for Proceedings of the Royal Society (including correspondence with Dr. W.D. Butt for 1962 article) 1939 - 62
205. Correspondence re various articles for Nature and the Biochemical Journal 1949 - 62
206. Miscellaneous correspondence with Cambridge University Press, with L.P. Wilkinson re: Keilin's obituary of Professor L.P. Pugh; with Geoffrey LaPage 1951 - 63
207. Miscellaneous correspondence with various scientific journals 1953 - 62
208. Miscellaneous invitations to lecture (in English, French) 1932 - 60
209. Miscellaneous requests to visit the Molteno Institute 1954 - 62
210. Miscellaneous undated letters n.d.
211. Requests for Keilin's offprints
- 212.- Files of confidential correspondence to be consulted only with
219. permission of the Keeper of Manuscripts, Cambridge University Library. A detailed list is included with the collection.

IX. Drawings

- 220.- Miscellaneous parasitological drawings relating to work by
222. Keilin, Nuttall, Ross. (some dated)

X. Historical material

223. Material relating to C.A. MacMunn 1867 - 1925
224. 'Physiological Atlas,' pen, ink and watercolor anatomical drawings by C.A. MacMunn 1873 to . .
225. Scientific correspondence of Professor G.H.F. Nuttall (in English, French) 1899 - 1910
226. Letters from Sir Ronald Ross to Professor Nuttall 1899 - 1901
227. Ms notes by Nuttall: 'Mosquito breeding places' n.d.
228. Obituaries of Nuttall; application for Quick Professorship 1906
229. Water-colour drawings of parasitological subjects by Mrs. Anna Keilin, signed and dated. 1919, 1929

XI. Index to principal correspondents
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THE ROYAL COMMISSION ON HISTORICAL MANUSCRIPTS

Report on further correspondence and papers of
DAVID KEILIN
(1887-1963)
biologist

deposited in
Cambridge University Library

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Supplementary catalogue of papers and correspondence of

DAVID KEILIN FRS

(1887 - 1963)

Material additional to CSAC 3/73

Compiled by

Jeannine Alton and Peter Harper

Deposited in the University Library Cambridge

1986

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GENERAL INTRODUCTION

PROVENANCE

The material was received from Mrs. Joan Whiteley (Keilin's daughter) at various dates June-December 1986. Although the collection is essentially additional to that catalogued in 1973 (CSAC 3/73) it also incorporates documents relating to the Molteno Institute Cambridge (item 6 of the 1973 catalogue) previously retained in family hands.

DESCRIPTION OF THE COLLECTION

The supplementary collection is particularly strong on biographical material relating to Keilin and his family, and includes several accounts, translations, summaries, explanatory notes and identifications prepared by Mrs. Whiteley.

There is documentation for the early life and work in Paris of Keilin, his wife Anna and his sister Marie (both doctors), and more sparsely of other members of their families. Of some interest are the sequences of letters written to Keilin by his wife from Manchester during the First World War, and by his daughter from Leeds during the Second World War, when each was pursuing a medical career. None of Keilin's replies to his wife survive but his frequent letters to Joan (A.73-A.78) are very interesting for their news of his research ideas and Cambridge affairs as well as for the picture they convey of his struggles with ill-health and his unassuming and endearing personality. The documentary record in Section A is complemented by photographs assembled in Section E.

Section B contains a little research material for the Cambridge period and some useful additional documentation for Keilin's long connection with the Molteno Institute before, during and following his appointments as Quick Professor and Director. The material held back from the 1973 collection is incorporated here.

Section C (Lectures and Publications) is chiefly of interest for Keilin's draft review for Nature of a book by Warburg (C.3) and for its extensive drafts and correspondence for his own book The history of cell respiration and cytochrome left unfinished at his death, completed by his daughter and published in 1966.

Section D (Correspondence), though slight, includes some exchanges with A. Szent-Györgyi and O. Warburg. Section E contains several interesting photographs of all aspects of Keilin's life, work, colleagues and family from 1907 to shortly before his death. Many of these were assembled and re-photographed by Mrs. Whiteley and bear dates and identifications by her.

ACKNOWLEDGEMENTS

Our main thanks are to Mrs. Whiteley for her care in assembling, translating and identifying the material. We also acknowledge with thanks the help of Dr. G.C. Stone (Hertford College, Oxford) in deciphering and translating documents in Polish and Russian.

J.B. Alton

P. Harper

Oxford 1986

Biographical and personal

A.6, A.7

Published accounts.

A.6 'Keilin, cytochrome and the concept of a respiratory chain', by E.F. Hartree, in Of Oxygen, Fuels and Living Matter, 1981.

A.7 'Keilin and the Molteno', by M.F. Perutz, The Cambridge Review, October 1986.

CAREER AND HONOURS

A.8

Early life and career

Residence certificate issued by Warsaw police, 1896.

School report, 1904.

Two documents relating to military service, 1908, the second issued at Imperial Russian Consulate, Paris, deferring call-up until end of university studies but not beyond age of 27.

Russian passport, issued 1911 and used to 1921, with visas for Britain, 1915, and return to Paris for doctorate 1917. Keilin is recorded on the passport as travelling with his sister, Hena (Niusha).

A.9

Liège University, 1905

Certificate of study; admission card to Botanical Gardens.

Biographical and personal

A.10-A.13

Paris

A.10 Personal documents.

Residence certificate, 1905, with later additions 1908, 1911.

Marriage certificates, July and September 1913.

Letter, 1915, from J. Verne.

A.11 Certificates of study, 1908 Zoology, Embryology; 1909 Botany; 1912 Geology.

A.12 Diplôme de Licencié ès Sciences.

Miscellaneous receipts and forms re certificates and dues.

A.13 Doctorate, 1917. Includes application for visa, supporting letter from G.H.F. Nuttall, arrangements made by M. Caullery, doctorate certificate (mention très honorable).

Also included in folder is letter to Keilin, 1918, with news of teachers and friends.

A.14

Cambridge, 1918

Miscellaneous biographical items, residence and military certificates, invitations, research and personal.

A.15

Election to Royal Society, 1928

Letter of congratulation (only one survives), fee receipts.

A.16

Miscellaneous items, 1920s, 1930s

National Portrait Gallery; passport; press cutting; Certificate of registration for Stephanie ('Shifra') Hershlik, who came to Britain to live with her daughter and son-in-law, 1921.

Biographical and personal

A.17 Miscellaneous items, 1940s

Card from colleagues in Paris, 1943.

Telegram from J. Needham urging Keilin to apply for Chair of Biochemistry, Cambridge, 1943.

Request (declined) to become first President of the newly-formed Society for General Microbiology, 1944.

Letter from M. Caullery on Keilin's election as membre correspondant, Académie des Sciences, 1947.

List of guests invited to Garden Party at Keilin's home on the occasion of the First International Congress of Biochemistry at Cambridge, 1949.

A.18 Miscellaneous items, 1950s

Copley medal (one letter only), 1951.

Offer (declined) of election as Fellow, Royal Society of Arts, 1952.

Correspondence re Hon. Doctorate, University of Liège, 1952.

Greetings card from 'reunion of former Molteno and Cambridge biochemists', Shanghai, 1959.

A.19 Miscellaneous shorter items.

Biographical and personal

A.20-A.40 Keilin's death

Letters of condolence, written jointly or separately to Anna and Joan Keilin, a few with replies.

A.20	A	A.29	L
A.21	Ba-Bi	A.30	Ma
A.22	Bl-Bu	A.31	Me-Mu
A.23	C	A.32	N-O
A.24	D-E	A.33	P-Q
A.25	F	A.34	R
A.26	G	A.35	Sa-Sl
A.27	H	A.36	Sm-Sz
A.28	I-J-K	A.37	T

A 38 U-Z

A.39	Lists compiled by Joan Keilin of those from whom letters were received; drafts of replies by Anna and Joan Keilin.
A.40	Will, Estate account, assets and liabilities.

Biographical and personal

FAMILY LETTERS AND MATERIAL

Anna Keilin, née Hershlik

- A.41-A.44 Early life in Poland (documents in Russian).
- A.41 Birth certificate, 1886; and French translation, 1906.
Residence certificate for 'Shifra' (Stephanie) Hershlik (mother),
certifying her as a Russian citizen in town of Velun, Poland.
See also A.16.
- A.42 School leaving certificates of Lycée at Lodz, 1902, and
addendum, 1905, re qualification as primary school teacher; and
French translation, 1906.
- A.43 Diploma as primary school teacher, Lodz, June 1905,
with photograph.
- A.44 Certificate of examination in Latin taken at boys' school,
Lodz, August 1905, with photograph. (Latin was not taught to
girls at that date.)
- A.45, A.46 Paris
- A.45 Dispense de grade, 1906.
Doctorate, 1915.
Testimonials to medical studies, 1915, 1916.
Receipts and dues.
- A.46 Residence certificate, 1906, and later amendments.
Russian passport issued 1905, with travel pass, 1913, as loose
document, and entry authorisation for Britain, 1915.

Biographical and personal

A.47-A.55 Britain

A.47 Documents relating to medical career, 1915-20.

Includes testimonials for Anna Keilin from Manchester Northern Hospital, Charing Cross Hospital, St. Mark's Hospital; brief correspondence re post at Cambridge, 1918; receipts and dues.

Also included is certificate of pass in medicine, Society of Apothecaries, London, March 1920, and letter to David Keilin about medical studies, undated but one month before Apothecaries examination. Letter is in Polish, with résumé translation and notes contributed by Mrs. Whiteley, December 1986.

Letters to David Keilin, 1915-17.

With the exception of letters written from Paris in 1915 and included at A.48, the correspondence is addressed to David Keilin in Cambridge and sent from Manchester where Anna Keilin was working at the Manchester Northern Hospital for Women and Children. It consists of letters, postcards and telegrams, some on hospital headed paper; a card or letter was sent almost daily and sometimes more than once a day. Almost all are in Polish with occasional phrases in French and more rarely in English. There is one letter in Russian. The content is mainly personal, but includes several references to life in Manchester and to Anna Keilin's professional work at the hospital.

A.48 1915 3 April, from David to Anna Keilin describing early days in Cambridge; 30 April, 31 May, Anna to David. All in Polish. Letters of 3 April, 31 May have résumé translations and notes contributed by Mrs. Whiteley, December 1986.

1916 July, August.

A.49 1916 September.

A.50 1916 October. Includes letter, 11 October, in French, to 'Mon cher maître' re a publication by Anna Keilin.

A.51 1916 November.

Continued

Biographical and personal

- A.52 1916 December. Includes draft applications and requests for testimonials, in English and French, for a post in 'un hôpital Londonien' [Charing Cross], and a Christmas letter of family news from sister- and brother-in-law, Edzia and Horace Havre, working in Portugal.
- A.53 Undated and fragmentary letters, probably 1916.
- A.54 1917 January.
- A.55 1917 February.

Joan Keilin, later Whiteley

Letters to her parents, written regularly during clinical medical training at Leeds, 1942-45, and undated. Content is mainly personal, but with frequent reference to course of study, lectures, operations and treatment, as well as details of wartime life in Leeds and some information on Cambridge affairs.

- A.56 1942 April, September, October.
- A.57 1942 November, December.
- A.58 1943 January, February. Letter of 22 February describes a weekend visit to H.A. Krebs and family at Sheffield.
- A.59 1943 March, April.
- A.60 1943 May.
- A.61 1943 June, July.
- A.62 1943 August.
- A.63 1943 September, October.
- A.64 1943 November, December.
- A.65 1944 January, February

Continued

Biographical and personal

- A.66 1944 March-May.
- A.67 1944 June, July. Includes description of military casualties treated at Leeds.
- A.68 1944 August, September.
- A.69 1944 October, November.
- A.70 1945 January, February, April.
- A.71, A.72 Undated or fragmentary letters.

Letters from Keilin to his daughter, with an occasional note by Anna, 1942-44. The content is mainly personal but with frequent reference to research in hand or planned, meetings and discussions, publications by Keilin and Joan Keilin, appointments and news of colleagues at Cambridge and elsewhere. Some letters include a few sentences in Polish, and some are written when Keilin was confined to bed during his regular attacks of asthma.

The sequence provides a detailed and endearing picture of Keilin's personality and activities.

- A.73 1942 January, April, September.
- A.74 1942 October-December.
- A.75 1943 January-March.
- A.76 1943 April-July.
- A.77 1943 August, October, December.
- A.78 1944 August. Undated and fragmentary letters.

Biographical and personal

- A.79 Telegram and letters from Anna to David Keilin, August 1943, from Leeds. In Polish.
- Two letters from Anna to Joan Keilin, April 1943, September 1944. In English.
- A.80 Miscellaneous later letters home written during holidays or conferences abroad, 1961, 1967.

Other relatives and friends

Most of these letters and cards are in Russian or Polish, and have translations, paraphrases, identifications or notes added by Mrs. Whiteley.

- A.81 Entin, Dunia (Keilin's sister) and Mordecai, 1928, 1937.
- Included here is Keilin's 1960 waiver of claim to the estate of his sister and family, most of whom died in the Warsaw Ghetto, in favour of his niece Irena Mitelman.
- A.82 Havre, Edzia (Keilin's sister) and Horace, 1943, 1944 and n.d.
- A.83 Keilin, Marie (Mania, Keilin's sister), 1923, 1924, 1944.
- A.84 Keilin, Motia (brother) and Genia, 1925, 1938.
- A.85 Keilin, Pańka, 1925.
- A.86 Miscellaneous postcards, 1915-17, from family and friends, with notes and possible identifications by Mrs. Whiteley.

Biographical and personal

A.87	Letters, cards, etc. from friends:	
	Filitz, J.	1918
	Heyman, S.	1943
	Ivanoff, S. and M.	1916, 1918, 1944. Includes photograph.
	Kopeć	1932, 1937
	? Pavlovski	1928

SECTION B THE MOLTEÑO INSTITUTE, CAMBRIDGE B.1 - B.34

B.1 -B.13 Research and teaching

B.14-B.34 History and administration

See A.7 for an account of Keilin's long involvement with the Molteno.

RESEARCH AND TEACHING

- B.1 Exercise book (covers detached) with some loose pages intercalated. Both ends of book used.
Experiments, results, graphs, most in Keilin's hand but some by another. Some pages bear dates, November-December 1930, February 1931, January 1932.
- B.2 Small red notebook of miscellaneous content. Only one page dated 'VII 1935'.
Includes list of 53 matters to be investigated, experiments to do, ideas or notes on cytochrome and oxidases; list of 21 similar notes for research on several topics; list of 9 similar 'Experiments on Respiration of Ascaris Parasites'; list of 9 'Collaborative problems'. At rear of book, similar lists of 13 and 11 topics, and miscellaneous other notes.
- B.3 Small notebook of miscellaneous content, bibliographical references, addresses, etc. At rear of book a few later notes, 1968, by Mrs. Keilin.
- B.4 Small loose-leaf notebook, n.d.
Mainly chemical formulae and molecules.
- B.5 Miscellaneous notes, graphs, etc. on haemoglobin.
- B.6 Notes on 'Estimation of haem capacity of proteins'.
- B.7 Notes and graphs on cytochrome c.
- B.8 Miscellaneous notes.

The Molteno Institute, Cambridge

- B.9 Ms. lecture on 'Porphyrin' variously paginated, some pages dated 1943, 1944.
- B.10 Examination questions set by Keilin.
List of lectures given by Keilin at Cambridge, 1937-58.
- B.11-B.13 Theses.
- B.11 1928. Keilin's report.
1929. Keilin's report on doctorate thesis by A. Szent-Györgyi 'On the function of peroxidase systems'.
- B.12 n.d. early 1930s. Keilin's report on thesis by N.U. Meldrum.
1939.
- B.13 1959. Ms. notes and comments.
n.d. Notes and comments by Keilin, Hartree and Dixon.

HISTORY AND ADMINISTRATION

- B.14 (Part only) letter to G.H.F. Nuttall re Keilin's work, from U.S. Department of Agriculture, 1917, perhaps related to offer of post.
- B.15 Grant applications and research reports to Medical Grant Committee and Medical Research Council for Keilin's work as assistant to Nuttall, 1922-29. Report for 1925 records discovery of cytochrome. Folder includes card from Nuttall, 1929.
- B.16 'Regarding Parasitology'
Memorandum by Nuttall on the history and future of the journal, January 1932. Keilin and E. Hindle took over editorial responsibility from that date.

The Molteno Institute, Cambridge

- B.17 Correspondence with Medical Research Council and Rockefeller Foundation re support from the Foundation for Keilin's work, 1932; press-cutting re gift.
See also B.21.
- B.18 Keilin's letter re death of first Secretary-Librarian of Molteno, and support for family, 1934.
- B.19 Notes from J. Gray on research projects and personnel at Department of Zoology, n.d., 1930s.
- B.20 Letter from I. Molteno, 1940.
- B.21 Correspondence with Rockefeller Foundation re help for refugee scientist (1942) and re five-year grant for Keilin's research (1947).
- B.22 Photocopy of Keilin's letter to Medical Research Council re support for molecular biology and work of M.F. Perutz and J.C. Kendrew in Cambridge, 1947.
- B.23 Brief correspondence only re Nuttall Memorial Celebration, 1951.
- B.24 Correspondence, 1950-51, re Keilin's Report on 'The Molteno Institute of Biology and Parasitology', prepared for Cambridge University General Board and relating to the future of the Institute. A copy of the report, and of Keilin's circulation list, are included.
- B.25 Keilin's carbons of letters to others, setting forth his views on the qualities looked for in the head of a parasitology department, 1951.
- B.26 Keilin's carbons of letters re his forthcoming (October 1952) retirement as Quick Professor and as Director of the Molteno, election of successors and his future research plans, April, June 1952.

The Molteno Institute, Cambridge

- B.27 Five bundles of ms. notes by Keilin, prepared as aide-mémoires for discussions with Secretary of Faculties, and with N.M.V. Rothschild, re affairs of the Molteno. All bear dates on verso attributed by Mrs. Whiteley from Keilin's private diaries June-July 1952.
- B.28 Notes for Keilin's speech at celebration of hundredth birthday of C. Warburton at Molteno, 1954. Also included here are brief letter and photograph from Warburton to Mrs. Keilin, 1954.
- B.29 Brief correspondence re Keilin's retirement research at Molteno, financial statements of Nuffield Grant expenditure, 1955, 1956.
- B.30 Papers, 1962, re future of the Molteno and proposed discontinuance of the Quick Professorship, all heavily annotated by Keilin.
- B.31 Continuing correspondence, 1963, re Molteno and Quick Professorship and meeting of General Board, 13 February 1963, which Keilin attended by invitation and at which he died. Includes miscellaneous ms. notes prepared for the meeting.
- B.32 Miscellaneous undated notes and jottings, mainly about the Molteno and its activities, but also includes 4pp. notes probably prepared for Council of the Royal Society.
- B.33 Reports of the Quick Professor of Biology, 1931-34, 1934-37, 1937-40, 1943-46, 1945, 1946-49, lists of publications.
- B.34 Miscellaneous printed matter on the history of the Molteno, its publications, and on Nuttall.

SECTION C LECTURES AND PUBLICATIONS C.1 - C.32

Many of the documents have attributions or annotations added by Mrs. Whiteley.

- C.1 'Preparation of Cytochrome c', collaborative paper with E.F. Hartree, published in Biochemical Preparations, 2, 1949, under the title 'Cytochrome c'.
4pp. typescript with ms. corrections.
- C.2 'Effect of low temperature on the absorption spectra of haemo-
proteins ...', collaborative paper with E.F. Hartree, published in Nature, 164, 1949.
9pp. typescript with ms. corrections.
- C.3 Review of O.H. Warburg: Schwermetalle als Wirkungsgruppe
von Fermenten, published in Nature, 165, 1950.
8pp. '2nd draft', 6pp. list of 29 points of disagreement, headed 'Warburg', letter from Nature re review, 1949.
Also included in folder is Keilin's copy of Warburg's 1929 papers on oxidation, bound together and with many annotations by Keilin.
- C.4 'Cytochrome', collaborative paper with E.C. Slater, published in Brit. Med. Bull., 9, 1953.
24pp. typescript.
- C.5 'Cytochrome', 6pp. typescript with a few ms. corrections for a paper; note by Mrs. Whiteley suggests a relation to collaborative paper with A. Tissières published as 'Haemoglobin in moulds' (Nature, 172, 1953). 2 copies with different ms. corrections.
- C.6 Miscellaneous typescript and ms. draft, incomplete, for 'Distribution and diversity of haemoglobin' (Acta. Biochim. Polonica, 1956).

Lectures and publications

C.7-C.30 The History of Cell Respiration and Cytochrome

Keilin's posthumous book, prepared for publication by his daughter, C.U.P., 1966.

Drafts

This material is mainly typescript, copied up by Keilin's daughter from his notes or earlier drafts, and usually bearing ms. indications by her of where the material was to be, or had been, incorporated in the book. Many of the texts are very heavily annotated or revised by her. There are also some ms. notes, comments or suggestions in the hands of E.F. Hartree and E.C. Slater. A few of Keilin's own ms. or typescript notes survive.

- C.7 Plans and outlines for book, some under original title 'Respiration and metallo-protein catalysts' (see 1953 correspondence with C.U.P. at C.24), material for introduction.
- C.8 Ideas for mottoes.
- C.9 Chapter 1.
- C.10 Chapter 2.
- C.11 Chapter 3.
- C.12 Chapter 4.
- C.13 Chapter 5.
- C.14 Chapter 6.
- C.15 Chapter 7. Chapter including discussion of work by Warburg. Multiple drafts and revisions.

Lectures and publications

- C.16 Chapter 8.
- C.17 Chapter 9.
- C.18 Chapter 10.
- C.19 Chapter 11.
- C.20 Chapter 12.
- C.21 Chapter 14.
- C.22, C.23 Bibliographical and other notes, several in Keilin's hand (Joan Keilin's lists enclosed).
2 folders.

Correspondence

Except for C.24, correspondence is conducted with Joan Keilin.

- C.24 Correspondence and contract with C.U.P., 1953, for book under its original title Respiration and metallo-protein catalysts, later amended to The History of Cell Respiration and Cytochrome.
- C.25, C.26 Correspondence with C.U.P. re publication, publicity, reviews, U.S. publication, etc. Includes correspondence with Nature, 1968.
- C.25 1964-66 C.26 1967-69, 1975
- C.27 Correspondence with colleagues re book, 1964, 1965.
- C.28 Correspondence with colleagues, readers and reviewers, 1965-67.

Lectures and publications

- C.29 Publicity material, extensive lists of names and addresses for circulation.
- C.30 Reviews.
- C.31 Invitations to lecture, letters of thanks.

Royal Academy of Netherlands 1938; Harvard 1949; University of London 1952; John Ray Society Cambridge 1954; Natural Science Club Cambridge 1954; History of Science Committee Cambridge 1954; Leeuwenhoek Lecture 1959.
- C.32 Correspondence with publishers and editors.

Invitation to write book on Cytochrome and Other Enzymes of Respiration, 1939; Nature, 1954; Science Progress, 1961.

SECTION D	CORRESPONDENCE D.1 - D.29	
D.1	Adrian, E.D.	1939
	Declining offer of appointment, and describing research.	
D.2	Agricultural Research Council	1941, 1946
	Invitation to serve on ARC, letter of thanks at end of service.	
D.3	Barcroft, H.	1943
	One letter only.	
D.4	Barcroft, J.	1960
	Keilin's carbon only, <u>re</u> Barcroft's papers.	
D.5	Buxton, P.A.	1953
	Award of Jaffe Grant to R. Christophers.	
D.6	Conant, J.B.	1930
D.7	Dale, H.H.	1933
	<u>re</u> a ms. by Keilin submitted for publication.	
D.8	Department of Scientific and Industrial Research	1945
	Keilin's resignation as Chairman, Pest Infestation Committee.	
D.9	Dirac, P.A.M.	1940
D.10	Dobell, M.	1949
	<u>re</u> C. Dobell.	
D.11	Hindle, E.	1950, 1954
	Correspondence 1950 <u>re</u> benefaction; correspondence 1954 <u>re</u> celebration of 100th birthday of C. Warburton.	
	See also B.28.	

Correspondence

- | | | |
|------|---|----------------|
| D.12 | Holiday, E.R. | 1951 |
| D.13 | Institut International de Chimie-Solvay
Invitation (declined) to 5th meeting, Brussels; includes programme,
list of participants. | 1934 |
| D.14 | Kapitza, P.
Text of Keilin's telegram recommending treatment for hepatitis. | 1945 |
| D.15 | Laidlaw, P.P.
Preparation of cytochrome <u>c</u> . | 1935, 1936 |
| D.16 | Lichtenthaeler, C.
Book on cytochrome. | 1947 |
| D.17 | Medical Research Council
Letter of thanks at end of service. | 1946 |
| D.18 | Meldrum, N.U.
Card only, 1933; later correspondence is with Meldrum's uncle
and publisher <u>re</u> possible reprinting of his book on cellular
respiration.

Also included here is note by D.E.H. Whiteley, 1986, on the
Meldrum family. | 1933, 1944 |
| D.19 | Mellanby, E. | 1952 |
| D.20 | Pope, W.J.
Keilin's draft letter only, on diphtheria toxin. | n.d., pre-1919 |
| D.21 | Quastel, J.H. | 1941 |
| D.22 | Sherrington, C.S. | 1938 |

Correspondence

- | | | |
|------|--|---------------|
| D.23 | Stern, K.G. | 1938 |
| D.24 | Szent-Györgyi, A.
Research and publications, mainly on fumaric, pyruvic and oxaloacetic acids. | 1932, 1936 |
| D.25 | Thorson, G.
Research at Marine Biology Laboratory, Copenhagen. | 1960 |
| D.26 | Virtanen, A.I.
Haemoglobin research. | 1945 |
| D.27 | Warburg, O.H. and others
Includes Keilin's letter of congratulations on Warburg's Nobel Prize for 1931; programme of conference on oxidation at Heidelberg, March 1932 (Keilin spoke on cytochrome) and correspondence arising; research, specimens, meeting. Also includes letter from G. Millikan while working in Warburg's Institute, 1934, and Keilin's recommendation of Warburg for Hon. Fellowship of Chemical Society, 1938.
Correspondence 1946 is with F.J. Philpot on Warburg's postwar situation. | 1931-38, 1946 |
| D.28 | Letters of congratulation to colleagues on honours and awards, and/or their replies. Various dates 1944-53 and undated. | |
| D.29 | Brief correspondence, 1945, 1960, on books and reprints. | |

Photographs

- E.10 B. Straub; A. Szent-Györgyi and family; H. Tamiya; Y.L. Wang.
- E.11 C. Warburton (2 photographs, one 1934 when Warburton, who lived to celebrate his centenary, was eighty); Weinberg; T.S. Work.

Keilin in laboratory

- E.12 Six photographs including Quick Laboratory in Medical Museum before move to the Molteno in 1921; 'Chemical Room' 1930s; with equipment; in laboratory 'office' 1960s.

Keilin with colleagues

- E.13 Seven photographs, with M. Dixon, E.F. Hartree, E.C. Slater, J. Parizek, and on an expedition from Molteno early 1920s.
- E.14 Receiving honorary degree, Utrecht, 1956.

FAMILY AND PERSONAL

- E.15 Student days in Paris, 1907-13
Five postcards of groups, some including Marie (Mania) and Niusha Keilin.
Photograph of Anna, David and Niusha Keilin, 1913
- E.16 Family and friends.
Keilin's parents; sisters Dunia, Marie 1915, 1964; group in Warsaw 1936 (Motia, Dunia, Niusha and others); Ivanoff and Picado (Paris c.1912).
- E.17 Keilin.
Photocopies of early photograph in school uniform, c.1897, and in Paris, c.1912; Cambridge 1919; at home (three photographs 1950s).
- E.18 Three photographs of Keilin at home with Anna, Joan, Ann Bishop.

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