

DM 1310  
DM 1310  
[Strongroom]  
Store

Catalogue of the papers and correspondence of  
SIR FREDERICK CHARLES FRANK Kt, OBE, FRS  
(b.1911)

Compiled by Timothy E. Powell and Peter Harper

Volume I

List of Contents  
General Introduction  
Sections A - F

Deposited in Bristol University Library

1989

All rights reserved

32939

The work of the National Cataloguing Unit for the Archives of Contemporary Scientists, and the production of this catalogue, are made possible by the support of the following societies and organisations:

The Biochemical Society  
The British Library  
The Geological Society  
The Institute of Physics  
National Power  
Pergamon Books  
Rolls Royce plc  
The Royal Society  
The Royal Society of Chemistry  
The Society of Chemical Industry

NOT ALL THE MATERIAL IN THE COLLECTION  
IS YET AVAILABLE FOR CONSULTATION.  
ENQUIRIES SHOULD BE ADDRESSED IN THE  
FIRST INSTANCE TO:

THE LIBRARIAN  
BRISTOL UNIVERSITY LIBRARY  
BRISTOL

**LIST OF CONTENTS**

	<u>Items</u>	<u>Page</u>	
GENERAL INTRODUCTION		4	
SECTION A	BIOGRAPHICAL	A.1-A.98	8
SECTION B	BRISTOL UNIVERSITY	B.1-B.151	21
SECTION C	RESEARCH	C.1-C.203	40
SECTION D	PUBLICATIONS	D.1-D.271	63
SECTION E	LECTURES AND BROADCASTS	E.1-E.90	101
SECTION F	SOCIETIES AND ORGANISATIONS	F.1-F.380	112
SECTION G	CONSULTANCIES	G.1-G.130	152
SECTION H	VISITS AND CONFERENCES	H.1-H.169	173
SECTION J	CORRESPONDENCE	J.1-J.266	200
SECTION K	REFERENCES AND APPOINTMENTS	K.1-K.62	220
LIST OF PUBLICATIONS			224
INDEX OF CORRESPONDENTS AND ORGANISATIONS			236

## GENERAL INTRODUCTION

### PROVENANCE

The papers were received in March and October 1988 from Sir Charles Frank.

### OUTLINE OF THE CAREER OF F.C. FRANK

Frederick Charles Frank was born in Durban, South Africa, in 1911. His parents returned to the U.K. very shortly after his birth. Frank was educated at Thetford Grammar School and Ipswich School before gaining scholarships to Lincoln College Oxford in 1929 to read Chemistry. He took his B.A. with first class honours in 1932 and received his B.Sc. a year later following research on phenyl-nitro-methane under N.V. Sidgwick and L.E. Sutton.

Frank went on to research for his D.Phil. on dielectric loss in organic materials with W. (later Lord) Jackson under E.B. Moullin at the Oxford Engineering Science Laboratory, following which he spent 1936-38 at the Kaiser Wilhelm Institut für Physik, Berlin-Dahlem, continuing his study of dielectric loss under P. Debye.

On his return to Britain Frank won an 1851 Senior Studentship to study at E.K. Rideal's Colloid Science Laboratory Cambridge but his dielectric studies of rubber and plastic were cut short by the outbreak of war. Frank spent the first year of the war working on smoke-filters and smoke-screens with O. Gatty, joining the Chemical Defence Research Establishment, Porton, in June 1940. In November, however, Frank was transferred to the Air Ministry's Assistant Directorate of Intelligence (Science) at the request of its Assistant Director, and Frank's friend from Oxford, R.V. Jones. He spent the rest of the war with the Air Ministry. 1940 was also the year of his marriage to Maia Maita Asché, the daughter of Professor B.M. Asché.

In 1946 Frank took up a post in the Bristol University Physics Department for research in solid state physics (initially dielectric relaxation, and relaxation of the Kerr effect) though one of the first topics which engaged him was the synthesis of the elements in the origin of the Universe. Through sharing a room with W.K. Burton and N. Cabrera, however, Frank switched to research on crystal dislocations. His work with Burton and Cabrera was to demonstrate the role dislocations play in the growth of crystals. Apart from crystal defects Frank's wide-ranging research interests at Bristol included the mechanical properties of polymers, the theory of liquid crystals and the mechanics of the interior of the Earth.

Frank was appointed Reader in 1951, Melville Wills Professor in 1954 and Henry Overton Wills Professor and Director of the H.H. Wills Physics Laboratory in 1969. Appointment as Professor Emeritus upon reaching official retirement age in 1976 enabled Frank to continue with his research.

Among the many honours accorded to Frank were the OBE in 1946, election to Fellowship of the Royal Society in 1954 and the conferral of a Knighthood in 1977. Frank was given Honorary Degrees by the universities of Ghent, Bath, Warwick, Surrey and Paris-Sud and by Trinity College Dublin, received awards from the Physical Society and Société Française de Physique, the Royal Society, the American Society for Crystal Growth, the Royal Swedish Academy of Sciences, the Institute of Physics and the American Institute of Metals and was elected to Associate Membership of the U.S. National Academy of Engineering, the U.S. National Academy of Science, the Indian National Academy of Sciences and the Royal Society of South Africa.

#### DESCRIPTION OF THE COLLECTION

The material is presented in the order given in the List of Contents. This large and comprehensive collection covers almost all aspects of Frank's professional career.

Section A, Biographical, consists principally of Frank's own biographical material and records of his career, and family and personal correspondence. Some of Frank's non-scientific interests are represented in a subsection of Clubs and Associations of which he was a member or supporter.

Section B, Bristol University, is chiefly Departmental and University administrative papers and related correspondence. Frank's service with the Colston Research Society is documented as is his contribution to the establishment of the Tyndall Memorial Lectures. The organisation of Frank's research and its funding through the Solid State Physics Fund, and his teaching duties are also represented.

Section C, Research, documents Frank's scientific research from the early 1930s. The material, principally manuscript notes, drafts, calculations and diagrams, covers a wide range of Frank's scientific interests including dielectric loss, crystal dislocations, properties of polymers, liquid crystals and geophysics. Wartime research is also represented in the section, particularly work on rockets.

Section D, Publications, brings together notes, drafts, correspondence and other related material for Frank's published work, 1935-88. This material has been linked wherever possible to Frank's numbered list of publications which is reproduced as pp.224-235 of the present catalogue. There is also an extensive sequence of editorial correspondence with publishing houses, learned societies and journals for which Frank acted as adviser, reviewer or referee. This sequence includes Frank's letters to *The Times* on scientific and non-scientific topics.

Section E, Lectures and Broadcasts, is a relatively small section. The material is mainly drafts for Frank's lectures and broadcasts (chiefly for BBC radio in the late 1940s).

Section F, Societies and Organisations, is the largest in the collection. It documents Frank's association with 44 British, overseas and international organisations including the Faraday Society, the Institute of Physics, the International Organisation of Crystal Growth, the Pugwash movement, the Royal Society and the Science Research Council. Frank was also involved with a number of local, Bristol institutions including Badminton School, the Bristol Municipal Charities and Queen Elizabeth's Hospital school.

Section G, Consultancies, comprises material relating to Frank's work for commercial organisations undertaken 1949-86. The best documented is Frank's extensive work for De Beers for whom he served on the Diamond Research Committee which oversaw De Beers-funded diamond research in UK universities

and which organised the Diamond Research Conferences. A short consultancy with British Rail, whom he advised on water-softening 1949-51, is well documented and consultancies with General Electric and IBM are also represented.

Section H, Visits and Conferences, presents a chronological sequence, 1939-87, of some of Frank's many engagements, both at home and abroad. He made many trips to the U.S.A, frequently in conjunction with a summer consultancy, and served as Visiting Professor at the Institute of Geophysics and Planetary Physics, La Jolla, California 1964-65. In 1979-80 he visited India as Raman Research Professor.

Section J, Correspondence, is a substantial section which includes several extended exchanges with friends, colleagues and former students. Among the correspondents are N. Cabrera, J.D. Eshelby, R.V. Jones and F.R.N. Nabarro.

Section K, References and Appointments, includes material for Frank's service as External Examiner for the universities of Aberdeen and Newcastle-upon-Tyne, and correspondence and papers relating to his work as Assessor for the Royal Society's Paul Fund. This material is subject to restricted access.

#### ACKNOWLEDGEMENTS

We are very grateful to Sir Charles Frank for making the material available and for his advice and encouragement.

Timothy E. Powell  
Peter Harper  
Bath 1989