Catalogue of the papers and correspondence of

CHRISTOPHER STRACHEY

(1916 - 1975)

Compiled by Jeannine Alton, Harriot Weiskittel and Julia Latham-Jackson

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GENERAL INTRODUCTION

Christopher Strachey was born in 1916. His father was the cryptographer, Oliver Strachey, from whom he may have derived his lifelong love of visual, verbal and mathematical puzzles and problems. His mother, Ray Costelloe, was an active suffragist; she built, largely with her own hands, the 'Mud House' near Haslemere which was a family holiday home and was used by Strachey throughout his life as a place of retreat for thinking or writing.

Strachey was educated at Gresham's School, Holt, Norfolk (where he won a medal for the High Jump), and at King's College, Cambridge. He read mathematics and physics, and on leaving the University took an appointment as a Research Physicist in the Valve Research Laboratories, Standard Telephone & Cables Ltd., where he worked on the theoretical design of centimetric radar valves. After the war he became a schoolmaster at St. Edmund's School, Canterbury, 1945-49, and at Harrow School, 1949-52. It was during his period at Harrow, and in his spare time, that he began to construct a draughts-playing program for a computer. His temperamental ingenuity and mathematical training coalesced and he had found his métier. According to The Times obituarist, he 'suddenly appeared' in 1950 at the National Physical Laboratory 'with a draughts-playing program for their Pilot ACE'; this is not strictly the case, though it is true that 'this was extraordinarily sophisticated work, particularly for an unknown amateur'. In fact, Strachey had learned the autocode of the Pilot ACE from M. Woodger in January 1950 and had devised a draughts-playing program, but was frustrated by the delay in commissioning the machine, which was not capable of running his program until late 1950. A demonstration in 1951 of an improved version of the program and, characteristically, of a program to play 'God Save the King' on the Manchester Mark I machine led to his appointment as Technical Officer, National Research Development Corporation, 1951-59. During this period Strachey was involved in work on various computers built by Ferranti Ltd. and by Elliott Bros., though he is also remembered for another jeu d'esprit, the 'Love Letters' program for the Manchester machine.

Major projects were the St. Lawrence River Power Project, described as 'another tour de force which advanced the opening of the Great Lakes to shipping by many years', logical design for the Elliott 401, and the overall design of the Ferranti Pegasus. Of this, Strachey wrote: 'Pegasus was unusual in that this assembler and

library system was designed and completely written before the prototype machine was completed. I did most of the work of commissioning the prototype machine'. A not dissimilar example of his insistence on the primacy of software may be seen many years later, in March 1969, when Strachey's operating system (written in BCPL) for the Modular One machine supplied for his Programming Research Group in Oxford enabled the machine to pass its acceptance trials within hours of its delivery and to be in full operation in 48 hours.

In 1959, at the first international conference on information processing, Strachey gave a paper, Time-sharing in Large Fast Computers, which broke new ground at the time. Strachey himself later moved away from the concept and became 'largely disenchanted with the idea of using a very large machine to do a great many very small jobs', but his name has remained associated with time-sharing.

In the same year, 1959, Strachey left the National Research Development Corporation and, with Peter Landin as his assistant, set up a private consultancy, working from his London house in Bedford Gardens. This was a relatively rare enterprise for the period, and he was consulted by a large proportion of the computer manufacturers then operating in Britain, as well as continuing to work on specific projects for the National Research Development Corporation. His own primary interest in high-level programming languages and mathematical semantics was furthered by his work on LIST for the EMIDEC 2400 machine, and led in 1962 to a part-time appointment at Cambridge University Mathematical Laboratory and a Senior Research Fellowship at Churchill College, Cambridge. The project was the design of the hardware and software of the Titan computer, later known as the Atlas 2. Strachey's specific contribution to the project was the development of a general purpose programming language (known as CPL) and its compiler. In a tribute to Strachey, published in Computer Bulletin, September 1975, David Barron writes of this episode:

> We never did get a compiler, but at the end of it he had formulated some of the fundamental ideas of modern programming languages, had sown the seed for the work on formal semantics that he and Peter Landin were later to pursue, and I had gained an understanding of programming languages the depth of which I have only recently come to appreciate.
>
> One of our first concerns was the name of the language. One of the ideas we floated, and discarded as too presumptuous, was 'Programming language one'. We have been kicking ourselves ever since. We eventually settled on CPL, for 'Cambridge programming language', and

when later a group from the Institute of Computer Science in London joined the project the same acronym was used, the meaning now being 'Combined programming language'. It did not escape notice that the initials could also denote 'Christopher's programming language', and that is how I, for one, would wish it to be remembered. We devoted a lot of time in the early days to syntactic matters, particularly to the problem of defining operator precedence so that the 'obvious' mathematical meaning of an expression is retained. However, this preoccupation with syntax was short-lived, being terminated by the enunciation of Strachey's first law of programming: 'Decide what you want to say before you worry about how you are going to say it'. Following this dictum, Christopher began to think about the formal semantic definition of languages, particularly by use of the lambda calculus, and produced a number of highly significant concepts, notably 'left hand values' and 'right hand values', the direct descendant of which is the reference concept that is central to Algol 68. Although CPL was never completely implemented, and scarcely used, it had a remarkable influence. BCPL, devised by one of Strachey's students as an implementation subset of CPL, had established itself as an implementation language in its own right; POP-2 and Algol 68 show many traces of CPL in their design.

The work on CPL also bore fruit more directly for Strachey. It led to his development of the General Purpose Macrogenerator, 'a simple but very general string processor', and to the paper Towards a Formal Semantics, which he described as 'the beginning of a mathematical (as opposed to operational) approach to formulating the semantics of a programming language', and on which he continued to work, in collaboration especially with Dana Scott, for the rest of his life. It also led to the Summer School on 'Advances in programming and non-numerical analysis' held in 1963 at Oxford, where, in 1965, the Programming Research Group was established under Strachey's direction. He remained there, as Reader then Professor in Computation, and Fellow of Wolfson College, until his death in 1975.

From about 1962, Strachey began to be increasingly involved with public life and policy in computing. He served on various committees of the British Computer Society, the Department of Scientific and Industrial Research and later the Science Research Council, the International Federation for Information Processing, and others. He was also in demand for lectures and papers, at conferences, working parties, symposia and the like, as well as to referee research proposals and publications. In 1971, Donald Michie wrote: 'Today an "invisible college" of programming theory exists throughout the Universities of Britain. Almost every member of this "college" was guided along the path at some stage by Strachey's direct or indirect influence'.

Although, in compiling the above outline of Strachey's career and work, use has been made of printed obituaries and tributes, the collection itself documents the whole story, often in great detail. This is because Strachey was of a squirrel-like temperament, retaining his own papers and incoming material. From time to time, too, he would draw up a tabulated 'state of affairs' document summarising aspects of his life and activity. Much of the collection is indeed Strachey's own manuscript, in a small hand which hardly varied with time; the programming for the Manchester machines, the mathematical calculations on eigenvalues, the LISP compiler, the Modular One Compiler, and many others, are all entirely in his hand. There are also multiple drafts for major papers on Fundamental Concepts in Programming Languages (1967, unpublished), Varieties of Programming Languages (1972), and A Theory of Programming Language Semantics (1974, unpublished). Of more than personal interest, too, are the various receipts and account books, particularly those relating to his private consultancy, which show how such an enterprise could be run at the time.

The Section on Strachey's consultancies often includes programs, reports and other printed or duplicated material emanating from the firms or manufacturers involved. These have been retained, as subsequent mergers and changes in the British computer industry have often occurred.

There is no bibliography of Strachey's writings; he was notoriously reluctant to commit himself to academic writing and some of his major work remained unfinished or unpublished at his death. Shorter articles, papers and drafts can be found passim. See especially Sections C, F and G; there is a note in the introduction to Section H on such material included there.

PRESENTATION

The extensive nature of the material necessitated a division into 'Sections' which is in many ways artificial. A general list of contents is given on pp. 2-3, and a more detailed index of the Working papers, notes and calculations precedes Section C; introductory notes accompany each of the major projects and cross-references are provided where possible.

The Index of correspondents includes individuals, organisations and firms.

PROVENANCE

The material was assembled from the house of Mrs. Barbara Halpern, Strachey's sister, and from his room at the Programming Research Group, Oxford.

LOCATIONS OF OTHER MATERIAL

Mrs. Halpern retains a small amount of personal material and photographs.

Oxford University Programming Research Group retains the following manuscript lecture notes:

Diploma Course 1968-69:
Introduction to Programming Languages.

Lecture Notes, Hilary Term 1970:
Mathematical Theory of Semantics.

Lecture Notes, Michaelmas Term 1971:
Theory of Mathematical Semantics, Lattice Theory.

Lecture Notes, Hilary Term 1972:
Semantics of Programming Languages.

Lecture Notes, Hilary Term 1973:
Mathematical Semantics of Programming Languages.

Lecture Notes, Michaelmas Term 1973:
Fundamental Concepts in Programming Languages.

Lecture Notes, Hilary Term 1974:
Mathematical Semantics of Programming Languages.

Lecture Notes, Hilary Term 1975:
Mathematical Semantics of Programming Languages.

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Mrs. M.M. Edwards, for careful and accurate typing, and forbearance with successive drafts and revisions of the catalogue.

SECTION A BIOGRAPHICAL AND PERSONAL A.1 - A.78

A.1 Obituaries and tributes, by D.W. Barron, Lord Halsbury, and others.

Also included here is a typescript of 'An Appreciation of Christopher Strachey and his Work' by D.S. Scott, published as a Foreword to J.E. Stoy: 'Denotational Semantics: The Scott-Strachey Approach to Programming Language Theory', M.I.T. Press, 1977.

A.2 Biographical material and interviews.

Includes miscellaneous curricula vitae, autobiographical notes, etc. prepared by Strachey on various occasions, 1946, 1956, 1962, 1965, 1967, 1971, 1973.

'Getting down to software fundamentals', interview with Strachey by Nancy Foy, in Dataweek, Vol.12, no.2, 8 July 1970 (photocopy). The original publication also carries a front cover photograph of Strachey.

'The word games of the night bird', interview with Strachey by Nancy Foy, in Computing Europe, 15 August 1974.

'Computing: Can Britain Set the Pace', article by D. Michie in University of Edinburgh Bulletin, November 1971.

A.3 Bibliographies and lists of published works, mainly prepared by Strachey for Lord Halsbury at various dates, 1971-73.

Some of the material in the above items has been drawn on in framing several of the catalogue entries.

A.4 Letters of condolence received on Strachey's death.

Organisation and programme of Requiem Mass at Blackfriars, Oxford, 21 June 1975.

A.5 Pocket diaries: 1948, 1949, 1952-65 (2 diaries for 1965), 1968-74.

For further diaries covering Strachey's work as a private consultant, see A.56-A.60.

Biographical and personal

A.6 Tabulated account of his life and activity, drawn up by Strachey.

The information, itemised by year and by month, is compressed in Strachey's very tiny handwriting on to 2½ sheets of writing-paper. The earliest entry is for 1926, and the entries have been added in blocks of two or three years at a time, to the end of 1964.

Personal and professional events are recorded, and the account is remarkable for the amount of information encompassed.

A.7 Address books (8) and loose pages of addresses. One of the books bears a note by Mrs. Halpern (Strachey's sister): 'must have been started some time in the 1930s at latest'.

A.8 Miscellaneous receipts and accounts.

3 packets parcelled and labelled by Strachey as follows:

'Cambridge receipts 1934 - August 1939'.

'Blackheath 1939-1940'.

'Ilminster receipts'.

Included here are miscellaneous receipts 1941-45 relating to Strachey's employment at Standard Telephones and Cables.

A.9 Miscellaneous receipts and accounts.

2 green account books, one including details of Strachey's administration of various family accounts and monies, 1941-42, one 'Letter Book', 1940.

2 envelopes of Bank Statements covering Strachey's and family accounts, 1940-1947.

1 S.O. Book of domestic accounts, n.d. c.1945.

For receipts and accounts at Harrow, see A.32.

For account books covering Strachey's work as a private consultant 1959-65, see A.48-A.55.

Biographical and personal

A.10 Gresham's School, Holt, 1930-1935.

Medal for '1st High Jump, under 16'.

Essay on 'Unselfishness' dated May 1935.

A.11-A.17 King's College, Cambridge, 1935-1939.

A.11 Ring-back notebook of 'Miscellaneous Notes' of lectures attended: includes

'Cockroft (sic). Production and Measurement of Low Temps.'

'Adiabatic Demagnetisation'.

'Properties of Liquid Helium'.

'Resistance of Metals at Low Temps.'

A.12 Notebook, dated October 1936, 'Constitution of Matter. Lord Rutherford'.

Notes on lectures.

A.13 Essay on current trends in vice, submitted for the James Essay Prize, 1937 (typescript), 14 pp.

A.14 'History of Morals', an outline plan of research, 3 pp.

Includes letters, October 1938, from Joan Bennet and Basil Willey to whom Strachey appears to have written about the scheme.

A.15 'Value Judgments. Ethics and Aesthetics'. Ms. draft for a talk.

A.16 'Science, Psychology and Religion'.

Plan for an essay or more extended work, covering 'The battle, The proponents, The result, The solution', with 4 pp. more developed ideas.

A.17 Ring-back notebook, 'Atmospheric Electricity', notes of lectures attended, some dated January 1939.

A.18 Correspondence relating to Strachey's appointment as Physicist, Valve Development Laboratory, Standard Telephones and Cables Ltd. [S.T.C.], 1939.

Biographical and personal

A.19	Brief correspondence re Strachey's enquiry about admission as Research Student at Cambridge. Includes postcard sent from T.R.E. Malvern by E.S. Shire referring to Strachey's work at S.T.C.	1943
A.20	Correspondence with S.T.C. re Strachey's wish to leave the Company and pursue a teaching career, 1945; includes testimonials from C.E. Strong (Chief Radio Engineer, S.T.C.) and from D. Beves (King's College, Cambridge).	1945
A.21	Miscellaneous applications for posts in schools.	1945.

Biographical and personal

A.22-A.29 St. Edmund's School, Canterbury, 1945-48.

A.22 Correspondence and appointment as physics and mathematics master, St. Edmund's School, 1945.

A.23 Journal kept by Strachey of early days at St. Edmund's, October 1945.

A.24 Loose-leaf notebook with detailed plans for physics syllabus and for advanced mathematics scheme, with breakdown into terms and periods, forward planning to 1949, and fully written-up course with demonstrations on Surface Tension for 6th Form.

A.25 Notebook, '10 Questions', dated March 1946, on calculus, algebra and mechanics.

A.26 Notebook, 'Higher Certificate Maths and Physics Answers' (analyses of previous examination papers).

A.27 Notebook, 'Cambridge Maths. Scholarship papers. Solutions' (analyses of examination papers set by different Cambridge colleges).

A.28 Notebook, 'Mathematical Problem Papers. Solutions'.

A.29 Folder of material relating to music at St. Edmund's.

Includes a talk by Strachey 'On learning a musical instrument', encouraging boys to join school orchestra, and his description, instructions and diagrams of the school gramophone.

A.30 Miscellaneous applications for posts in schools, 1948-49.

Includes copies of Strachey's c.v., letters of application and testimonials, correspondence with referees and schools.

Biographical and personal

A.31-A.38 Harrow School, 1949-52.

(Strachey taught Mathematics and Physics.)

A.31 Correspondence re appointment (1949), housing arrangements (1949-50), confirmation of appointment as Master of the School (August 1951) and resignation on acceptance of post with National Research Development Corporation (November 1951); mainly with Headmaster and Bursar.

A.32 Receipts and accounts during employment at Harrow (some of the salary statements also cover employment at St. Edmund's School, Canterbury, 1946-48).

A.33 Miscellaneous papers and calculations on physics, especially electricity and circuitry.

Notes on 'Circle Constructions (Apollonius problem)'.

Ms. on 'Quantum Theory of Radiation', 'Atomic Energy', etc.

Detailed tables of pupils' performances in mathematics and physics examinations.

A.34 Miscellaneous general knowledge papers set at Harrow by Strachey.

A.35, A.36 2 papers on Cybernetics, perhaps for meeting of club or society at Harrow, with interesting views expressed; duplicated typescript.

A.35 'Cybernetics', 15 pp.

A.36 'Social implications of cybernetics. The coming second industrial revolution', 10 pp.

A.37 'Interplanetary travel'.

Ms. and typescript versions, and calculations on various factors in space travel.

A copy of Harrow School magazine for 1950, in which the article appeared (pps.18-23) is included.

Also included here is a copy of H.M. Inspectors' Report on Harrow, May 1951.

A.38 Folder inscribed 'Miscellaneous maths problems (in hand!)'.

Miscellaneous notes and calculations, n.d. but c.1950. Some intended for school use, others more advanced.

Biographical and personal

A.39-A.42 Technical Officer, National Research Development Corporation [N.R.D.C.], 1952-59.

See under National Research Development Corporation in the Index of correspondents for references to projects undertaken by Strachey.

A.39 Correspondence re Strachey's appointment to the Corporation, with M.H.A. Newman, Lord Halsbury and others, October-December 1951. Strachey's letter to Newman of 5 October 1951 gives a clear outline of his career to date, referring to his growing interest in digital computing via M. Woodger and ACE, A.M. Turing and the Manchester machine, his draughts programme, etc.

Newman's and Halsbury's letters refer to the impressive quality of the programs prepared by Strachey for the Manchester machine, including his 'God Save the King' musical program.

A.40 Envelope of 'Salary and fee slips 1952-59'.

A.41 Patent Application for 'Improvements in or relating to circuit arrangements for dividing binary numbers', invented by Strachey during work on Elliott D.F. Calculator while employed by N.R.D.C. 1956-57.

A.42 Correspondence and drafts re Patent Application for 'Computer Director Case', 1959. Correspondence continues 1960-63.

A.43 Application for appointment as Director of the University of London Computational Unit. 1956-57

(Strachey applied for the post in November 1956 and withdrew his application in March 1957.)

Biographical and personal

A.55 Account Book for P. Landin, 1959-64.

A.56 Diary for P. Landin, 1960.

A.57-A.60 Strachey's Engagement diaries, 1960, 1961, 1962, 1964.

Biographical and personal

A.61-A.64 Churchill College, Cambridge, 1962-65.

Strachey was a Senior Research Fellow of the College and was engaged in part-time work at the Mathematical Laboratory on CPL and the Titan project. His work was at first 'half-time' and later 'three-quarter time'.

A.61 Brief correspondence with the College, including letters from Master (Sir John Cockcroft) offering Research Fellowship, 1962, and accepting Strachey's resignation on his departure to Massachusetts Institute of Technology, 1965.

A.62 Correspondence with M.V. Wilkes, Director, Mathematical Laboratory, re offer of post for work on Titan project (1962), and Strachey's resignation, 1965.

A.63 Application for post of Professor of Computing Science, Imperial College, London, 1964.

Includes brief correspondence with S. Gill, who was appointed to the Chair.

A.64 Correspondence re invitation to Strachey to work on time-sharing project at Computer Center, Berkeley, California. (Declined through pressure of work and other projects.)

A.65 King's College, Cambridge, 1961-62.

Brief correspondence re Strachey's election as member of High Table, dining rights, etc.

A.66, A.67 Visit to Massachusetts Institute of Technology, 1965.

Strachey was Visiting Lecturer for 7 months from September 1965.

A.66 Letter of appointment, miscellaneous accounts and receipts, travel arrangements, etc.

Correspondence with J. Weizenbaum re Project MAC and Strachey's report on his visit to Project MAC.

Letter to P. Elias with Strachey's outline of his proposed 'Mathematical Theory of Programming Languages Seminar'.

A.67 Correspondence with I.B.M. U.K. Ltd. re Strachey patents, 1965, 1966.

Biographical and personal

A.68-A.73 University of Oxford, 1966-75.

In April 1966 Strachey took up an appointment as 'leader of the group for research into the non-numerical uses of computers which is being set up in the Computing Laboratory under a grant from the Science Research Council'. The appointment carried the status of Reader; Strachey became an ad hominem Professor in 1971, his group being known as Programming Research Group (P.R.G.), see Section B. The Chair of Computation is now statutory, Strachey's successor (C.A.R. Hoare) being the first incumbent; the Chair carries with it a Professorial Fellowship at Wolfson College, where Strachey was a Fellow from 1966.

For working notes on projects carried out by P.R.G., see C.202-C.274.

A.68 Miscellaneous correspondence, letters of appointment, applications for sabbatical leave, correspondence re change from Reader to Professor, etc. A copy of O.U. Gazette re applications for the 'newly established Professorship of Computation', May 1976, is included here.

A.69 Correspondence and papers re 'B.R.S. Trust', a charitable educational Trust, founded by Strachey with Trustees A.W. Blackwell, M.P. Ramsbotham, J.D. Spofforth. Strachey did not wish his name to be directly connected with the Trust, which was intended to make small grants to individuals for educational purposes. His own letters and notes on the subject were often written on a computer. 1971-74.

A.70 Plans for alterations, furnishings, etc. at Strachey's house, 18 Worcester Place, Oxford, 1973.

A.71 Guest-lists and costings for house-warming and parties, c. 1973.

A.72 Folder of 'puzzles', verbal, visual and mathematical, created by Strachey at various times.

Included here is correspondence and material related to Strachey's winning of the New Scientist competition, three times running in 1961.

See also F.18.

A.73 Strachey's last computer programs at Oxford, 30 March and 7 April 1975, with descriptive ms. note by M. Harper (Programming Research Group).

Biographical and personal

A.74 Photographs and drawings of Strachey, from childhood.

Includes a 'computer portrait'.

A.75 Miscellaneous biographical items.

Includes:

'Catalogue' and 'Share Certificate' of 'The Mud Press' with a note by Mrs. Halpern that this was started and run by Strachey at age 11.

(The Mud House was the family home at Haslemere where Strachey regularly retreated to relax and think.)

Education Certificate, 1934.

Report on Strachey drawn up by Vocational Guidance Department, National Institute of Industrial Psychology, 1938.

B.B.C. Listener Research Report on a talk by Strachey 'Control without Men', May 1952.

Notebook inscribed 'Notes from Books', beginning with notes (perhaps at Cambridge) and continuing with inventories and particulars of The Mud House.

A.76 Miscellaneous biographical items re music, the Savile Club, The Cranium, Election to Distinguished Fellowship British Computer Society 1971, plans for holidays, draft of Strachey's Will, c.1973.

A.77 Miscellaneous biographical items.

Folder of correspondence, claims, etc. re a car accident, 1960-61.

A.78 Miscellaneous biographical items.

Passport, health certificates, membership cards, press-cuttings, etc.

SECTION B OXFORD UNIVERSITY B.1 - B.30

This Section traces the formation and expansion of the Programming Research Group under Strachey's leadership, and also includes some material relating to Wolfson College of which he was a Fellow.

The Programming Research Group was established at Oxford to investigate the general theory of information processing and the nature of computing machines. After an unsuccessful initial application by Strachey directly to the Department of Scientific and Industrial Research for a grant to establish such a group (B.2), Leslie Fox, Director of the Oxford University Computing Laboratory, applied in September 1964 on Strachey's behalf for a grant of £194,506 over 7½ years (B.4). In January 1965 a grant was awarded for £62,750 for the period 1 July 1965 to 31 July 1967. This original grant was extended and supplemented by the Science Research Council (successor to D.S.I.R.) over the years; when Strachey submitted his final report to the Science Research Council in May 1974, the funding totalled £224,900. Although the grant officially began on 1 July 1965, Strachey did not take up his post as leader of the Programming Research Group until April 1966. He became Reader in Computation in 1967 and Professor of Computation in 1971. He was elected a Fellow of Wolfson College in 1966 (B.27).

The many Progress Reports and descriptions of the Programming Research Group and its work illustrate the emergence of the Group's 'worldwide reputation as a centre both of theoretical work in the formal semantics of programming languages and of experimental work on operating systems and virtual machine design' (B.9).

The interview with Strachey published in Dataweek (A.2) gives an informal account of the P.R.G.

See also A.68, C.202-C.274.

Oxford University

B.1 'Computers and University Research'. 1962-63

4 pp. memorandum prepared by Strachey, June 1962, and circulated to D.S.I.R. Working Party on Computer Science.

See E.24.

Also included is a copy of a 'Memorandum on a proposed research unit in computer science' by M.V. Wilkes, 16 March 1963, also prepared for Working Party.

B.2 'Research in the theory of computation and information processing'.

Ms. draft (18 pp.) and 2 typescripts (November 1963) of Strachey's application to D.S.I.R. for grant to establish a new unit for research in theory of computation.

See B.4 for related correspondence.

A revised version, dated September 1964 and included here, was later used as Appendix B for the final report to the S.R.C., 1974.

See B.9.

B.3 Miscellaneous notes prepared by Strachey when writing the application.

Includes curriculum vitae, notes on salary scales and staff requirements, 'categories of the computing sciences', notes on 'M/c lang.'. 1962-63

B.4 Folder of correspondence and papers documenting the preliminary negotiations which led to the establishment of the Programming Research Group. 1964-66

Includes: Draft application by L. Fox to D.S.I.R. for a grant to Oxford University for research into non-numerical uses of computers, to be directed by Strachey (July 1964).

Strachey's ms. 'Notes on Fox's application'.

Correspondence between Strachey and Fox re this application and minor amendments suggested by Strachey. Strachey sent Fox a copy of the 'technical note' (in B.2) to accompany the proposal.

After the grant was awarded (from 1 July 1965), the correspondence continued re space, equipment and budget requirements of the new group. The name 'the programming research group', suggested by Strachey in his letter to Fox, 6 May 1965, was adopted.

Some correspondence with and re prospective members of the Group is also included.

Oxford University

B.5 'SRC Grant. Formal Documents'.

Includes: Copies of submission to S.R.C., official correspondence with S.R.C. and Oxford University re original grant to establish the Programming Research Group and re the extension and supplementation of the grant. 1965-74

Draft of letter by Strachey to S.R.C. reporting on work of Group to January 1969.

Letter from Leverhulme Trust Fund awarding grant to Strachey (to be channelled through Oxford University) for employing a research assistant on computer languages. 1975

B.6 Folder inscribed 'SRC Grant. General Accounts and Estimates'.

Correspondence with Oxford University and S.R.C. re budget estimates, salaries, equipment, maintenance agreements.

Strachey's notes, calculations, drafts of letters and memoranda. 1973-74

See also B.10. There is some overlap of contents between these two folders, but they remain in their original order.

B.7 'Progress Reports. SRC and University'.

4 reports for the Computing Laboratory, Oxford, 1965-66, 1966-67, 1967-68, 1968-69 (one page typescript each).

5 reports to the Science Research Council:

1965-66	2 pp. typescript
1966-67	2 pp. typescript
1967-68	5 pp. typescript
1968-69	13 pp. typescript
1970-71	13 pp. typescript

These reports provide a valuable summary of the activities of the Programming Research Group, its equipment, staff changes, publications and its theoretical and practical work.

Oxford University

B.8 Various documents describing the work of the Programming Research Group, 1968-74. All are stencilled copies of typescripts and are a useful supplement to the official reports in B.7. They were perhaps collated by Strachey when he was preparing the final report to the S.R.C. (B.9). 1968-74

Includes: 2 notes prepared for prospective graduate students, November 1968 and September 1970.

3 pp. note probably prepared for Oxford University re research, teaching, staff and publications of P.R.G., October 1970.

10 pp. copy of 'Application for a Research Grant' (to the S.R.C. for a supplement to the original grant), March 1971.

2 pp. note 'Position in 1972 and after'.

4 pp. draft report (by V.E.M. Bowell) evaluating work of P.R.G., August 1971.

Last page of letter from Chairman, Sub-Faculty of Computation, to Secretary of Faculties, Oxford University, re 'small number of academic posts in computing', 1974, and referring to the 'international reputation of P.R.G.'

2 pp. note prepared for presentation to Computing Science Board (see additional papers and correspondence in B.10), June 1974.

The folder also includes miscellaneous 'hand-outs' for students and staff of the P.R.G. re library, course work.

B.9 'Programming Research Group, Oxford. Final Report to the Science Research Council on Grant B/SR/14943. May 1974'. 1974

29 pp. typescript.

This official report is a careful detailed account of the origin and work of the Programming Research Group during the period of its support by the S.R.C. (1 July 1965-31 July 1974). Strachey discusses in the report the current work of the Group, the degree of success of its original aims, the results achieved, and also provides a chronological account of its progress.

Continued

Oxford University

B.9(continued) The report includes 4 appendices: a copy of the original application, the technical case for the original application, a list of publications and an annotated selected bibliography.

See also the papers for Strachey's presentation to the Computing Science Committee (B.10).

B.10 Folder of correspondence with the S.R.C. with reference to queries re administration of the grant (provision for senior visiting fellows, additional equipment costs, allocation and apportionment of staff salaries, claims for travelling expenses to conferences). 1966-74

Folder includes copy of report by D. Park to S.R.C. following visit to USA, May 1967, and also minor correspondence with Oxford University re revision and supplementation of the grant and re salaries paid by the University.

Folder also contains correspondence with the S.R.C. re meetings of the Computing Science Committee (of which Strachey was a member, see E.42 et seq.), a copy of Strachey's Comments on d'Agapeyeff's Paper 'Large On-Line D.P. Systems (Business Utilities) and their Software Engineering', sent by d'Agapeyeff before the January 1969 meeting, and papers (including ms. notes) for Strachey's presentation to the Computing Science Committee, 25 June 1974.

B.11 Folder of correspondence re arrangements for Board of Visitors of the S.R.C. Computing Science Committee to inspect work of Programming Research Group, 20 October 1970. 1970-71

Folder includes one letter re visit by Board on 2 June 1971. 1971

B.12 Folder of correspondence re arrangements for visit by P.R. Odgers and S.F. Edwards of Department of Education and Science to S.R.C.-supported groups in Oxford, 2 July 1974. 1974

Oxford University

B.13 'Quinquennial Application (1972-7), Oxford University'. 1970-71

Folder of correspondence and papers re submission by the Computing Laboratory.

Includes: drafts of application (by L. Fox);

estimate of annual cost of Programming Research Group for 1972/73;

copy of 'Report of the Committee set up by the Faculty Board [of Mathematics] to prepare the Quinquennial Application';

copies of correspondence between Strachey and Oxford University re S.R.C. grant (1971).

The Report was unable to recommend the establishment of a Chair in Computation; letter from Strachey re the Report.

B.14 Software Committee, Oxford University Computing Laboratory. 1967

Minutes and papers for 2 meetings (23 November and 11 December 1967). Papers include reports on ALGOL, COTAN maintenance, use of consoles and copies of Strachey's papers 'KDF 9 Software' and 'The Provision of Software'.

Folder also includes minutes of meeting of senior staff of Oxford University Computing Laboratory and inter-departmental memorandum re Computing Science Departmental Committee. 1967 1970

B.15 'System Meetings'. 1971-74

Folder of papers and notes by Strachey for meetings within Programming Research Group. Ms. notes by Strachey on 'Strings and Characters in BCPL'. Notes by other members of the Group on matters for consideration at the meetings.

B.16 Folder inscribed 'Next Oxford Computer'. 1966-68

Papers and minutes of Computing Laboratory Sub-Committee, established to prepare submission to the Computer Board for new computing equipment and staff at Oxford.

Questionnaire (December 1966) and resulting report (May 1967) on 'Computing in Oxford University'.

Minutes of meetings on 5 April, 6 May, 31 May 1968. Correspondence.

Continued

Oxford University

B.16(continued) Cost comparison for central machine room hardware.

'Configuration for the New Machine'. 2 pp. memorandum by Strachey, 6 May 1968.

Draft report for the Computer Board, 27 May 1968, with ms. annotations by Strachey. Typescript of additions to the document, circulated to Sub-Committee after its meeting to discuss the report.

B.17 'Software Blast'. 1967-68

Papers re supply of computer software to universities, as submitted to the S.R.C. and the Computer Board for increased funding. See E.43 for similar material.

'The Provision of Software'. 2 pp. memorandum, 15 December 1967, sent by Strachey to B.H. (now Sir Brian) Flowers, Chairman of the Computer Board for Universities and Research Councils, and to F.J.M. Laver of the Ministry of Technology. Reply from Laver, 27 December 1967; very full reply from Flowers, 3 January 1968.

'Software for University computing'. 10 pp. memorandum by D. Michie, January 1968.

'Provision of Software to Universities as a Computer Responsibility'. 3 pp. draft of paper by A. Colin, Strachey and R.M. Needham for the Computing Science Committee of the S.R.C. Letter of comments from L.F. Rutherford, Secretary of the Computer Board, as passed on by J.H. Price of the S.R.C. with revised draft of the paper (not in folder). Both letters annotated by Strachey.

2 offprints of articles re software.

B.18 Applications and related correspondence for positions in the Programming Research Group as Departmental Research Assistant and/or Programmer (not indexed). 1968

B.19 Requests to join or work with the Programming Research Group, either on a permanent or part-time basis or as a visiting fellow. Some professional exchanges are included. In chronological order. 1965-74

B.20 Requests to visit Strachey and the P.R.G., from academics and industrialists in Britain and abroad.

Includes copy of Strachey's letter to The Observer, 1973, in response to an article by E.F. Schumacher re optimum size of machines and of organisations.
In chronological order. 1966-75

Oxford University

B.21 Requests to study at Oxford University or in Programming Research Group (not indexed).

Arrangements for appointments, suggestions for alternative courses at other universities. In chronological order. 1967-70

B.22 Correspondence and papers re Strachey's external examining for the B.Sc. course in Computer Science, University of Warwick.

Includes copies of proposed examination papers, Strachey's comments on the papers and his own notes, correspondence re arrangements for Examiners' Board meetings, etc. 1972-74

B.23 Correspondence and papers re loan of films from Bell Telephone Laboratories, USA for showing at Computer Film Festival, 15 March 1968, and at talk to engineering group in Oxford (see G.23 for Strachey's notes for this talk). 1968

B.24 'Burroughs Machines'.

Notes and minor correspondence re possible purchase of new computer by Oxford University. 1968

B.25 Papers and notes re furnishings and estimated expenditure for house at 45 Banbury Road, Oxford, occupied by Programming Research Group.

Correspondence with L. Fox and with Oxford University Chest re allocation of expenditure. 1966-68

B.26 Miscellaneous notes, invoices and correspondence re minor expenses of Programming Research Group as passed to Oxford University Chest for payment from S.R.C. grant (not indexed). 1966-69, 1974

Oxford University

B.27-B.29 Wolfson College.

B.27 'Wolfson'.

Letter offering Fellowship of the College, 29 July 1966.

Miscellaneous correspondence re college business. 1968-75

B.28 'Wolfson. Architect's Brief'.

Duplicated papers re requirement of new college; 7 pp. typescript of Strachey's comments on the brief. 1966

B.29 'Wolfson. Misc.'

Committee papers, all with Strachey's annotations. 1968-73

B.30 'List of files etc'.

Ms. and typescript lists of files maintained by Programming Research Group, and of Strachey's own files.

Note: Most of the headings listed in this folder appear as catalogue entries, but some have not survived.

SECTION C WORKING PAPERS, NOTES AND CALCULATIONS C.1 - C.274

The papers are presented chronologically as far as possible, in sub-sections devoted to various stages in Strachey's career (see list of contents overleaf). Strachey's own autobiographical notes make plain that many of his ideas developed from work in progress and flowed into later projects, and the separation here adopted is acknowledged to be an artificial one and is far from implying any break in the work.

These notes and papers were kept by Strachey separate from correspondence and committee files, but should nevertheless be read in conjunction with Sections D and E, and the N.R.D.C. correspondence in Section J, to which cross-references are given where possible. Strachey's own folders, titles and descriptions are retained, and bundles of notes clipped together by him have been left in his order. The early material was rarely dated, and was often written on the back of used papers dated several years previously, or on class exercises from school-mastering days. In these cases, approximate dates and descriptions have been suggested. Very bulky folders have been split for ease of handling, and a note made of their original grouping. Strachey's titles and descriptions are given in inverted commas.

During his employment at N.R.D.C. (1952 - 59), Strachey was principally concerned with the Ferranti computers for Manchester University, designed in conjunction with the Firm, the University and N.R.D.C. Most of these notes are simply headed 'M.U.C.' or appear on worksheets similarly headed, and it has not always been possible to assign them with certainty to a specific task or routine related to the project. See note to C.27 - C.115.

Working papers, notes and calculations

CONTENTS OF SECTION C

Each of the principal projects is preceded by a note on the content and presentation of the material.

STANDARD TELEPHONE & CABLES LTD. (S.T.C.), 1939-45 C.1 - C.19

AUTOMATIC COMPUTING ENGINE (ACE), 1950-51 C.20 - C.26

Draughts-playing program

NATIONAL RESEARCH DEVELOPMENT CORPORATION (N.R.D.C.), 1951-59 C.27 - C.115

C.27 - C.33	Completion of draughts-playing program
C.34 - C.36	Love-letters program, miscellaneous notes
C.37, C.38	St. Lawrence River Power Project
C.39 - C.64	Manchester University Computing Machine Laboratory
C.65 - C.94	Ferranti Pegasus Computer. Design and projects
C.95 - C.102	Very High Speed Computers
C.103 - C.115	Miscellaneous notes and drafts

PRIVATE CONSULTANCY, 1959-64 C.116 - C.135

C.116	Royal Radar Establishment
C.117	Ship Fairings
C.118, C.119	Traffic Control
C.120	ALGOL
C.121 - C.135	LISP/EMIDEC

Working papers, notes and calculations

CAMBRIDGE UNIVERSITY MATHEMATICAL LABORATORY, 1962-65 C.136 - C.201

C.136 - C.184	CPL
C.185 - C.196	BCPL
C.197 - C.201	General Purpose Macrogenerator

OXFORD UNIVERSITY PROGRAMMING RESEARCH GROUP (P.R.G.)
1966-75 C.202 - C.274

C.202 - C.207	Visits and work at Project MAC
C.208 - C.212	KDF 9
C.213 - C.223	Modular One (Mod I)
C.224 - C.241	Formal Semantics
C.242 - C.274	Miscellaneous notes and drafts

Working papers, notes and calculations

C.1-C.19 STANDARD TELEPHONE & CABLES LTD. (S.T.C.), 1939-45

C.1 Valve Laboratory Reports

This work was carried on at Woolwich, London, until 1940, when it was transferred to Ilminster, Somerset. The first four of the Reports listed below were produced from Woolwich, the remainder from Somerset; Strachey wrote or collaborated in all the latter, except where indicated.

The Reports bear the firm's number as follows:

(from Woolwich)	T.G.4, T.G.6, R.G.8, R.G.13	
(from Ilminster)	R.G.14 (not by Strachey)	G.67
	G.20	G.69
	G.36	G.74
	G.43	G.75
	G.46	G.77
	G.50	G.79
	G.52	G.83
	G.55	G.84 (not by Strachey)
	G.56	G.85
	G.57	G.93
	G.58	G.95
	G.59 (not by Strachey)	

C.2 Folder of miscellaneous lists of Laboratory Reports issued by various S.T.C. departments.

Miscellaneous bibliographic references and related offprints, 1940-44.

C.3 Strachey's Order Book indenting for items of equipment and machinery, various dates, 1939-43.

C.4 Notebook inscribed 'Mathematics', with contents page by Strachey, n.d.

These notes may have been begun during work at S.T.C. and continued later.

Working papers, notes and calculations

C.5 4 bundles of notes and calculations, the first being a sequence of 41 numbered pages, all on calculation of focal length through a slit. n.d., perhaps 1939-40.

C.6 'Velocity modulated receiving tubes. Theoretical notebook' (pages torn from a ledger-type foolscap notebook).

Notes begin 'The following are the results of calculations carried out between December 1939 and June 1940' and are dated 10.6.40.

Later notes are headed 'Theory of velocity modulated oscillators'.

C.7 Correspondence etc. re Memorandum by Strachey, published in Wireless Engineer, May 1940, correcting a previous letter on velocity modulated beams by R. Kompfner.

Kompfner corrected his article and also corresponded with Strachey.

A copy of Strachey's 'Memorandum' is enclosed; it appears also as G.45 in C.1. 1940

(Material originally included in C.9.)

C.8 Miscellaneous correspondence and memoranda on velocity modulation. 1942, 1943

Includes copy of letter from Strachey to P.B. Moon re velocity modulation and klystron, 1942.

(Material originally included in C.9.)

C.9 Bundles of notes, almost all with numbered pages, n.d. but probably begun 1940:

'Dynamic Similarity in Large Gaps', 3 pp.

'Reflecting Fields with Space Charge', 15 pp.

'D.C. Transit Time in a Reflecting Field', 7 pp.

'Theorem in Reflecting Fields', 4 pp.

'Conditions for ... reflexion in the absence of space charge', 2 pp.

Untitled, 13 pp.

Untitled, 10 pp.

Graphs of parabolic fields.

Working papers, notes and calculations

C.10 3 bundles of notes, graphs and calculations, n.d.

'H.F. Slope of Infinite plane diode'.

'Calculation of field in cylindrically symmetrical system'.

'Fremlin's Integral' (J.H. Fremlin was a colleague and collaborator of Strachey's at S.T.C.).

C.11 3 bundles of untitled notes with numbered pages, and miscellaneous loose pages. n.d. c.1942.

Includes copy of letter to P.J. Daniell arranging for Strachey and Wallis to visit him to discuss velocity modulation, 1942.

C.12 Folder 'Miscellaneous Maths'.

3 bundles of notes on numbered pages, on Fourier coefficients.

Notes on Hahn functions.

Notes on Elliptic functions.

Shorter notes on Laplace transforms, etc.

C.13 Bundles of notes, 'Problems'.

Ms. notes on calculation of date of Easter, signed H. Spencer Jones 27 February 1943.

Brief correspondence re work at Ilminster, 1942.

(Material originally in C.12 above.)

C.14 Bundle of notes and diagrams 'Counters for D.A.', n.d.

Extensive bundle of notes 'Shell Velocity Tables prepared for S.T.C., July 1945'.

Miscellaneous notes on circuitry and switching, n.d.

Folder includes letter from P.J. Wallis, 1944.

C.15 Notes on Bessel Functions.

An extended series of notes, in pencil, in a sequence of 4 bundles; 'Bessel Functions', pp.1-30; 'F of 3rd Kind', pp.31-49; '2nd Type', pp.50-68; 'Fourier-Bessel Series', pp.69-77.

Shorter notes on 'Bessel Functions'.

(Kept originally with C.16.)

Working papers, notes and calculations

C.16 Notes on Legendre Functions.

2 bundles of notes, in pencil, in sequence, pp.1-16 and pp.17-34.

Bundles of notes on T' functions.

Miscellaneous notes on 'Contour or Complex Integration'.

1 p. notes 'Peano', dated on verso 1945.

Other ms. and duplicated material (not by Strachey), 1945.

C.17 Autograph ms. of extended report on 'The Theory and Design of Velocity-Modulated Oscillators'.

The ms. is dated February 1945 (an earlier title-page is dated July 1944) and has a space for the Valve Laboratory Report number to be inserted.

Folder includes summary, contents, text, references, tables, indexes.

Included in the folder is a bundle of early notes and drafts for the report, written on the back of an adaptation by Strachey of 'The Crooked Billet', apparently for amateur production.

C.18 'Relay Switching'.

Notes on circuitry, perhaps begun at S.T.C., and continuing at St. Edmund's, Canterbury, 1946.

C.19 'Radio, etc.'.

Miscellaneous notes, circuit diagrams and manufacturers' literature, mainly on valves, acoustics, gramophone and radio receivers, etc. Various dates, 1941-47.

Working papers, notes and calculations

C.20-C.26 AUTOMATIC COMPUTING ENGINE (ACE), 1950-51

This section is primarily concerned with a draughts-playing program which Strachey began in his spare time while teaching at Harrow School. Strachey heard of the work on the Pilot ACE machine on 22 January 1950; by 23 February 1951 he had devised a program for the machine using eight delay lines (its full capacity), and the program was tried out on 30 July 1951 at the National Physical Laboratory at Teddington.*

The program developed into an attempt at autocoding (see Strachey's letters to A.M. Turing (C.22) and M. Woodger (C.23) of May 1951) and was modified and tried out on the Ferranti Mark I machine at Manchester University. Its success, and Strachey's skill in programming, led to his appointment to the National Research Development Corporation in November 1951.

The original program was reconstituted by B. Munday at N.P.L. in 1958 to be run on DEUCE (the successor of the Pilot ACE), and a copy is included by the courtesy of Mr. M. Woodger as C.26 below.

For the continuation of Strachey's work on the draughts-playing program on the Manchester machine, see C.27 - C.33.

* We are indebted to Mr. M. Woodger for this detailed information.

C.20 Folder labelled 'Relays'.

Miscellaneous notes for circuits, etc. n.d., but probably early work on draughts program 1950 (all written on verso of Harrow School exercises and notices).

Includes 5 pp. ms. notes in the hand of M. Woodger on the principal machines available, workers in the field, notes and diagrams on circuits.

Working papers, notes and calculations

C.21 Folder labelled 'Notes for lectures, possible future papers, etc.' n.d.

3 bundles of notes:

'Generalised Programming'.

'Analysis of Programming for ACE'.

Untitled notes on brackets (may refer to later work at Manchester).

C.22 Strachey's copy of his letter to A.M. Turing, 15 May 1951.

Written immediately after hearing Turing's talk 'Can Digital Computers think?', broadcast on BBC Third Programme on same day.

In his letter Strachey discusses the general problems of 'thinking machines', their application to the Manchester machine, and his modification of his ACE draughts program.

Note: The original of this letter is in the manuscript collection of A.M. Turing in King's College, Cambridge. (CSAC 53/7/77, Item D.5).

C.23 Folder labelled 'Universal Languages for Programmes'.

Miscellaneous bundles of notes on the subject, some written at later dates (one refers to ALGOL).

Folder also includes typed 'Extracts from letters C. Strachey to M. Woodger 25 May 1951', beginning: 'I have an idea about making the ACE do part of its own programming'.

Note: The originals of these letters, and of accompanying correspondence 24 February-2 June 1951, are in the possession of Mr. M. Woodger.

C.24 'ACE coding programme (Incomplete)'.

Folder containing 16 bundles of notes, calculations and diagrams on the subject, some on verso of Harrow School exercises.

C.25 'ACE Draughts. Current Programme'.

Miscellaneous notes and calculations, n.d.

C.26 Reconstitution by B. Munday in 1958 of Strachey's draughts-playing program (written for Pilot ACE), to be run on DEUCE.

22 cards, and 21 pp. program (photocopy of Strachey's ms.).

Working papers, notes and calculations

C.27-C.115 NATIONAL RESEARCH DEVELOPMENT CORPORATION (N.R.D.C.), 1951-59

The material relates to the following principal projects in which Strachey was involved during this appointment:

C.27 - C.33	Completion of the draughts-playing program begun for ACE.
C.34, C.35	'Love Letters' program, miscellaneous notes.
C.37, C.38	St. Lawrence River Power Project.
C.39-C.64	Manchester University Computing Machine Laboratory.
C.65-C.94	Ferranti Pegasus Computer. Design and projects.
C.95-C.102	Very High Speed Computers.
C.103-C.115	Miscellaneous notes and drafts.

Strachey's folders have been retained, and his titles or descriptions given in inverted commas. In the absence of his own indications, exact dates or attributions cannot always be given with certainty. Very bulky folders have sometimes been divided for ease of handling, and a note has been made of such cases.

For material relating to Strachey's appointment to N.R.D.C. see A.39 - A.42.

For projects undertaken at the request of N.R.D.C. when Strachey was working as a private consultant, see C.117, C.118-C.119, D.100-D.103.

Working papers, notes and calculations

C.27-C.33 Completion of draughts-playing program, 1951-52

For the original work designed for ACE, see C.20-C.26 above.

C.27 'Draughts. "Paper"'.

Includes: 4 pp. typescript on 'Draughts. General Considerations', perhaps introduction or contribution to a book on the subject.

Ms. and 2 typescript versions of a paper titled 'Programme for Manchester University Computer', giving 'modifications to the programme described above to make full use of the facilities of the Ferranti machine'. n.d.

C.28 'Draughts'.

Folder containing 13 bundles of notes, calculations and diagrams, most on paper headed Manchester University Computing Machine Laboratory, but some on verso of Harrow School exercises.

Some of the bundles bear Strachey's ms. comments or explanations on attached notes.

C.29 'Draughts. M.U.C. Programme and Notes etc.'.

Folder containing 10 bundles of notes, calculations and routines, many with Strachey's notes on the machine's game, e.g.: 'Not forseen by me - a good move';

'Purposeless - the strategy is failing badly in the end game', etc.

Various dates July-August 1952, though some notes are on verso of Harrow School exercises.

Strachey used some of these specimen games and comments in his paper at Toronto in September 1952, see C.32.

C.30 (Originally kept with C.29).

6 bundles of notes and photographs, with notes and explanations by Strachey, as follows:

'Example of machine errors. The machine (literally) had a screw loose when it did this'.

'Photographs of the monitor tube display during a game of draughts. These are best viewed at arm's length'.

'Examples of draughts as played by the machine. Most of these were expemental and show signs of errors, either in the programme or in the machine'.

Continued

Working papers, notes and calculations

C.30(continued) 'The complete programme for draughts as printed out by the computer' (dated 10 July 1952).

'Flow diagram and programme for the inner section of draughts. This part allows the machine to decide its own move. (This is my own working copy - hence its dog-eared state)'.

'Draughts. Instructions'.

C.31 'A Programme for Making a Calculating Machine Play Draughts'.

45 pp. ms. and typescript paper.

Miscellaneous drawings and diagrams for paper on draughts-playing machine (probably for Toronto paper).

C.32 'Logical or Non-Mathematical Programmes'.

Draft notes, ms. and typescript versions of paper given by Strachey at Association for Computing Machinery (A.C.M.) meeting at Toronto, September 1952.

Folder also includes offprint of a later paper on the subject by A. L. Samuel, 1959.

C.33 Blue exercise-book of notes taken on journey to Canada and USA, September 1952.

Includes an account of preliminary talks with Professor Watson about the St. Lawrence Seaway project (see C.37, C.38), of discussions and people met at A.C.M. Conference, and of Strachey's visits to firms and universities in USA to see work in progress on computers, with his views on the various methods, programs, costings, etc. of Harvard Mk.IV, RCA Bizmac, UNIVAC machines.

See H.2 for a similar notebook kept on Strachey's journey to USA in 1957.

Working papers, notes and calculations

C.34, C.35 'Love Letters' program, 1952

Two folders of notes, calculations and routines for a program to write love-letters, for the Manchester machine.

This is a good example of Strachey having fun while trying out new routines.

The notes are not dated, but are probably late 1952, as there is a reference to 'Toronto input' (the Toronto A.C.M. meeting in September 1952).

C.34 'Love Letters Programme M.U.C.'.

C.35 'L.L. Mk.II'.

C.36 'Notes on papers, lectures, etc.'.

Folders of notes taken by Strachey at lectures or colloquia, or from articles in the literature, by Wilkes, Fox, Lanczos, etc.

Very few are dated, but some are dated 'Cambridge Colloquium 12.6.52.' and '26.4.56.'

Working papers, notes and calculations

C.37, C.38 St. Lawrence River Power Project, 1952

The first sale of the Manchester Mark I computer built by Ferranti Ltd. was to the University of Toronto in 1951, through the close association of the Ferranti Electric Co. with Professor Watson of the University. The machine was known as FERUT (Ferranti University of Toronto).

In 1952 the University wished to make use of its computer to assist the Canadian Government in its share of the cutting of the St. Lawrence Seaway, and in particular by computing water surface profiles above a dam over a 50-mile stretch of the river past the Thousand Islands. Strachey met Professor Watson in September 1952 (see C.33) and subsequently produced a program with the codename Backwater.

The program was successful as such, but the machine had 'teething troubles' and was difficult to service and maintain at so long a distance.

The project is described in the following extract, quoted by permission from a private history of the Ferranti Computer Group:

> The St. Lawrence Seaway job however was an opportunity for N.R.D.C., and particularly for Christopher Strachey who was lent to develop the program for calculating the effects of the plans on the water flow of the river past the Thousand Islands. Vivian Bowden had sold the computer to Toronto University in 1951; Strachey went over in the autumn of 1952 and in three months the computer had done sums which it had been estimated would take clerks with hand machines 20 years.

C.37 Folder of notes including:

Outline of the problem (sent from Toronto) with specifications, definitions, etc. 6 pp. May 1952.

Strachey's ms. notes on the organisation of his program, 4 pp.

Letter and draft for an article on the problem by H. Cotton of Ferranti, sent to Strachey for comment, 1956.

Working papers, notes and calculations

C.38 'Backwater - FERUT'.

Folder of notes, calculations, routines.

17 bundles, of which the first carries a ms. note by Strachey 'Schematic plan of part of the St. Lawrence river covered by the 'Backwater' programme (about 50 miles). The loops represent islands. Dotted lines indicate alternative directions of flow in a channel.
(These are work sheets)'.

Only one set is dated, 5 November 1952.

Folder also includes the programme of a course of lectures on 'The application of digital computers to technical research and development' given at Northampton Polytechnic, London, October 1955, at which Strachey spoke on the St. Lawrence project.

Northampton Polytechnic had a Pegasus computer provided by N.R.D.C., and was in the forefront of computer studies in UK educational institutions.

See G.1 for a course of lectures given there by Strachey on the Ferranti Pegasus.

Working papers, notes and calculations

C.39-C.64 Manchester University Computing Machine Laboratory

Design and projects.

C.39 Ferranti Ltd. folder, containing an 'Introduction' to the new Ferranti High Speed Digital Computer.

29 pp. duplicated typescript, signed B.V.B. (Bertram Vivian Bowden, now Lord Bowden).

C.40 'Programmers' Handbook for Manchester Electronic Computer Mark II', inscribed 'With the Compliments of A.M. Turing' (not in Turing's hand). n.d., perhaps March 1951.

This is the First Edition Handbook, compiled by Turing himself, and very difficult to operate. Turing is known to have sent a copy to Strachey while he was working on his draughts-playing program at Harrow. Strachey contrived to master the handbook sufficiently to be able to run his draughts program on it overnight when he visited Manchester. This was considered a real achievement. (see A.39).

The handbook bears ms. annotations and corrections by Strachey.

Note: Though described as 'Handbook ... mark II', this is the Mark I Handbook, which was the basis for modifications introduced for Mark I*, and for Mark II (subsequently Mercury).

C.41 Programmers' Handbook (Third Edition) for the Mark II (Mark I*).

Includes prefaces to the First Edition (as in C.40) n.d., the Second Edition, by R.A. Brooker, August 1952, and the Third Edition, by R.A. Brooker, September 1953.

The handbook bears ms. annotations and corrections by Strachey.

C.42, C.43 2 black ring-back notebooks of programme sheets, codes and routines for the Manchester machine.

These contain duplicated and ms. material of various dates 1951-52, with some ms. pages of calculations inserted or loose, dealing with assembly, input, floatcode and other routines, preparatory to revision of handbook.

The duplicated pages bear many ms. comments, corrections, etc. by Strachey.

Note: C.43 contains a useful note contributed, 1978, by M. Campbell-Kelly on the likely attribution of various routines to A.M. Turing, C. Popplewell, A. Glennie, R.A. Brooker and Strachey.

Working papers, notes and calculations

C.44 Photographs of Manchester University Computer (most with description on verso).

Photographs of Ferranti Pegasus, taken in London, 1956-57, and of the Ferranti production line at the Moston works, Manchester.

C.45-C.49 'Ferranti Mk I*'.

Contents of a folder of miscellaneous notes, calculations and reports as follows:

C.45 Strachey's original folder, including ms. notes on 'Ferranti Fort Halstead machine', miscellaneous codes, notes and queries by Strachey, n.d.

C.46 'B.T.M. Cards - Punch & Read'.

Includes a note of principal computer laboratories and researchers in USA, perhaps for 1952 journey (see C.33).

C.47 Ferranti's List DC 6 of instructions, etc. for Manchester Universal Electronic Computer, with notes and queries by Strachey, 1953.

C.48 'Radix 32 Input Scheme' (duplicated typescript), December 1953.

C.49 'Proposed acceptance tests for Ferranti Manchester Universal Electronic Computer' (duplicated typescript), November 1953/January 1954.

'A radix 10 system of coding for Mark I' (duplicated typescript), March 1954.

Working papers, notes and calculations

C.50-C.61 Notes and routines for the Manchester Computer

These consist of notes and calculations for various procedures suitable for the Manchester University Computer and are almost all on the programming sheets designed for the machine.

Very few of the routines are dated; Strachey's descriptions are preserved. Information kindly supplied by Dr. C. Phelps (Oxford University Computing Laboratory) is given with acknowledgement in some of the entries.

C.50 'M.U.C. Uncompleted Routines'.

Bundles of notes, calculations and first drafts for procedures, bearing notes and descriptions by Strachey as follows:

'Multiple length arithmetic'.

'Input D. Needs revision - will not accept blank tape before number sequence ...'

'Reconsider when Formal Role working is possible'.

'Check by planting'.

'Worth further consideration'.
(This set is considered 'much more advanced than the others' by Dr. C. Phelps).

'Dull - needs revision'.

C.51 (Continued from above)

14 bundles of notes, calculations and routines, some dated 1951, 1953.

C.52 Folder of calculations and routines, perhaps related to above (some headed Pageprint, Floatpoint, etc.) but kept as loose sheets, not in bundles.

C.53-C.56 'M.U.C. Various Routines (some untested)'.

Large folder of bundles of notes, calculations and routines, which have been divided for ease of handling.

C.53 Input and other routines, with dates 1952-53 (in original folder).

Working papers, notes and calculations

C.54 16 bundles of notes, etc. relating to Floatpoint and Floataid routines.

The routines, which go up to 'Mark VI', were begun in 1952; they include one bundle labelled by Strachey 'Completed routines', one bundle consisting of an account of the purpose and use of a floating binary point, and one bundle with correspondence from K.V. Huddart, 1952, perhaps related to C.63.

C.55 6 bundles of notes dated 12 April 1955, on Bessel Functions Chebychev series, double length arithmetic, correction routines, etc.

C.56 2 undated bundles of notes.

Printout using all above routines, with ms. note by Strachey: 'Examples of the computer output (Manchester University machine).

The large sheet is a test of an output routine and consists of the numbers $\pm 2^{\pm n}$ for $n < 39$.

There is one error due to a programme fault'.

C.57-C.61 'Math. Theory of Subroutines for various functions'.

Large folder of notes and calculations, some on verso of Harrow School exercises, some on Manchester University Computer programming sheets, etc.

C.57 Exercise book, 'Constants and Useful Numbers in Binary notation' (and other notes).

C.58 3 Bundles of notes on mathematical functions (in original folder).

C.59 'Arctan' (2 bundles, some pages dated 1955).

'EXAPP' (2 bundles).

C.60 4 bundles of notes:

'(D.L.) Digital Division'.

'Digitwise formula'.

'D.L. Exp.'.

'Elem. Fns.'

C.61 Miscellaneous untitled notes, mainly of approximations to elementary functions.

Working papers, notes and calculations

C.62-C.64 Projects using Manchester University Computer routines, 1951-53.

C.62 'Surge Shaft', 1951-52.

This was the 'Garry Project' for the design of a Quoick surge shaft, for Sir William Halcrow and Partners.

Bundle of notes and calculations re project from Sir William Halcrow and Partners, December 1951-January 1952.

Ms. and typescript versions of Strachey's description of 'Surge Shaft routine' and 'Fundamental equations'.

8 bundles of notes, calculations, routines.

C.63 'Ferromag'. December 1952-May 1953.

Correspondence and papers re the Ising model of ferromagnetism, a problem suggested to Strachey by S.P. Frankel, California Institute of Technology and worked out with the help of K.W. Huddart.

Folder includes correspondence and 6 bundles of notes, calculations and routines, and computer printout of program with Strachey's comments.

C.64 'Head Wrightson'.

Notes and calculations for a routine of this name for M.U.C., apparently based on 'Equations of Equilibrium for Three-Stage Let-Down of Kuwait Crude' (enclosed), n.d.

Working papers, notes and calculations

C.65-C.94 Ferranti Pegasus Computer. Design and projects

The Pegasus machine incorporated some of the techniques of standard packages developed for the 401 computer made by Elliott Bros. with support from N.R.D.C. The abbreviation F.P.C.1, used on many of Strachey's folders, originally designated Ferranti Packaged Computer No.1, but later stood for Ferranti Pegasus Computer.

Strachey was responsible to N.R.D.C. for the overall machine design, instruction set and detailed writing of the multiplier-divider units; he also specified and wrote much of the initial software which contained a comprehensive assembly system for incorporating library sub-routines.

The Pegasus machine proved very popular, and 38 were made. See G.1 for a course of lectures on 'Programming for the F.P.C.1' given by Strachey at Northampton Polytechnic, London, January-March 1955.

See D.41-D.81 for material relating to Ferranti Mercury and Orion machines.

The folders preserve Strachey's ordering and titles, though very bulky folders have been divided for ease of handling. Few of the documents are dated, and some of the early items relate to the Ferranti machines in use at Manchester and Toronto on which Strachey learnt and tested programming ideas and techniques.

C.65, C.66 'Notes on Logical Design'.

Bundles of notes and routines for Pegasus, with titles as follows:

C.65 '2 digit mult[iplier] with 1 adder'

'F.P.C. Divider. Proof of algorithm'

'F.P.C. Division Algorithm'

'General Division Processes'

'Fast Division by 3'

'Multiplication'

'Slow signed multiplier'

C.66 (Continued from above)
'3 - address code' (3 bundles).

Working papers, notes and calculations

C.67 'Logical design of Units'.

Bundles of notes and calculations, with titles as follows:

'Decimal conversions'

'Ternary Logical Units'

'Counters'

'Search Register'

'Tape Input (Magnetic and Paper)'

Some loose pages, and a note by D. Gillies on 'Gillies Adder-Subtractor'.

C.68 'F.P.C. Library Subroutines'.

Folder of miscellaneous routines with Strachey's ms. note of contents on the cover. These are tested routines of square root, exponentials, logs, sin/cos, arctan, Input Output Steering routine.

C.69 (Continued from above)

Routine called 'R.C.S. [Routine Changing Sequence].

Notes, calculations and test.

This may be Strachey's first scheme for calling routines (Dr. C. Phelps's note on the work is included in the folder.)

C.70 'F.P.C.1. Tape Codes'.

Folder of correspondence, drafts and calculations re above, and Strachey's proposals, September-December 1954.

Includes commercial literature from Creed & Company on teleprinters, suggested models for codes (some by Strachey, others annotated by him), notes of discussions between Ferranti and N.R.D.C., drafts and calculations by Strachey and others, comments on Strachey's codes, correspondence on articles.

Strachey's autograph draft on 'F.P.C. Tape Code', 10 pp., is included here.

Working papers, notes and calculations

C.71 'Punched Paper Tape Codes'.

Duplicated copies of Pegasus Input and Output Teleprinter Code (December 1954) and F.P.C. tape code, with many ms. corrections and annotations by Strachey.

These are based on, but not identical with the draft in C.70 above. Dr. C. Phelps notes that the eventual code adopted came to light for the first time in Strachey's scribbled changes on p.6 of the document.

C.72-C.78 'Paper on Elem. Fns.'

(on routines devised as library subroutines for Pegasus)

C.72 'Routines for calculating the Elementary Functions'.

Ms. and typescript of paper so titled.

C.73 (Originally kept with above)

Bundles of related notes and calculations:

'Chebychev Polynomials'

'F.P.C.1 Notes for Subroutines'

Untitled (some pages dated 1955) and loose sheets.

C.74 'Elem. Fns.'

3 bundles of notes and calculations, and loose sheets, n.d.

C.75 'Elem. Fns.'

3 bundles of narrative, notes and calculations on 'Exponential Routines', n.d.

C.76 (Originally kept with above)

Work on 'Wide-range logarithm' sub-routine for Pegasus, notes, calculations, printouts. Various dates, 1955-57.

C.77 (Originally kept with C.75)

Correspondence and offprint on 'infinite series' and 'numbers with negative base', 1957.

C.78 '"Chebycheff" Fraction. Approximations'.

Miscellaneous calculations. n.d. but related to above.

C.79 'Misc. Pegasus'.

3 bundles of notes and calculations, some pages dated 1955.

Working papers, notes and calculations

C.80 'F.P.C. M/D Layout'.

5 bundles of notes and calculations.

C.81 'F.P.C.1 Loading and delays through units'.

Miscellaneous notes and calculations.

Typescript copy of 'loading rules', September 1954.

Working papers, notes and calculations

C.82-C.94 Projects using Ferranti Pegasus Computer

C.82-C.86 Work on 'Flutter' in aircraft. Begun April-June 1956.

This work, carried out in collaboration with R. Penrose, produced a program for testing on Pegasus, and led to further work by Strachey on matrices and collaborative work with J.G.F. Francis. See C.112, F.12.

C.82 6 pp. ms., and typescript, with ms. corrections, of paper on 'Flutter'.

C.83 (Originally kept with above)

Calculations, routines and printouts.

C.84 'Some matrix problems arising from the consideration of flutter in aircraft'.

4 pp. ms. and typed versions of paper dated 1 November 1956 with authorisation to publish, dated November 1957.

C.85 (Originally kept with above)

5 bundles of notes and calculations on flutter, almost all in Strachey's hand but some with additions by R. Penrose.

Includes note on 'The information required from flutter calculations' (not in Strachey's hand) and a letter on eigenvalue from R. Penrose, March 1958.

C.86 Correspondence on 'Flutter', 1957-58.

Includes: Letter to D.B. Gillies on Pegasus and on 'Flutter' (Strachey's carbon only), February 1957.

Correspondence with Armstrong Whitworth Aircraft Ltd. re visit by Strachey to demonstrate his 'Flutter' program on the Company's Pegasus machine, December 1957.

Correspondence with aircraft companies.

Miscellaneous brief correspondence with collaborator, J. Francis.

C.87-C.91 Work on Matrices using Pegasus (probably begun January-March 1957).

C.87 'Hilbert Matrix'.

Calculations, routines and printouts on Hilbert coefficients, eigenvalues and eigenvectors (printouts dated April-May 1957).

Working papers, notes and calculations

C.88 'Hilbert Matrix Programme'.

Similar material, routines and printouts on Hilbert coefficients, idempotents, eigenvalues and matrix inversion.

C.89 'Bordered Inversion'.

Calculations, routines and printouts on 'Bordered Hilbert test' and 'Bordered Inversion' (printouts dated October-November 1957); includes bundles of notes on 'Entry', 'Error Analysis' and a note headed 'A new method of inserting matrices'.

C.90 Loose pages of notes, originally kept with above.

Letter on matrices from J.H. Wilkinson, December 1958.

C.91 'Transformer Matrix Switching'.

4 pp. ms. and miscellaneous typescript pages of a paper dated 2 November 1959, with miscellaneous bundles, loose pages and photocopies of notes and calculations.

C.92 'Reactor Instability Problem', 1958.

Statement of problem (duplicated typescript, 7 pp.), and Strachey's calculations, using Pegasus machine.

C.93 'Coding Experiments'.

6 bundles of notes aiming to translate Pegasus programs to EDSAC II. n.d. but after 1958.

C.94 'Possible Order Codes'.

Calculations and routines for MUSE (Manchester University Computer) especially re autocode and floating point arithmetic, in response to a letter from N. Brown, January 1959 (enclosed).

See C.98.

Working papers, notes and calculations

C.95-C.102 Very high speed computers, 1957-59

Correspondence, committee papers, notes, calculations, etc.

Strachey was a representative of N.R.D.C. at meetings and on the Working Party to consider this project, and was in attendance at meetings of the N.R.D.C. Sub-Committee on Electronic Computers until March 1959.

C.95 Miscellaneous reports and memoranda re I.B.M. Stretch Computer (a very high speed machine) sent to Strachey as background information, with a memorandum by D. Hennessey.

C.96 'Large machines'.

Folder of miscellaneous papers, 1957.

Includes: Summary of meeting to discuss the technical problems of the development of a high speed computer, held at Harwell, April 1957.

Ms. and typescript versions of Strachey's paper on the design and specification of such a machine, July 1957.

Calculations and notes by Strachey for machine design and for administrative structure.

Memorandum on project by D. Hennessey, September 1957.

C.97 Correspondence, July 1957-January 1958, with companies in USA for information on high-speed circuits and components.

C.98 'Very fast machines'.

Folder of miscellaneous papers, January-June 1958.

Includes: 'N.R.D.C. and High speed computers', chronological summary of meetings during 1957 and notes on those attending meeting at Harwell, February 1958. (Strachey was N.R.D.C. representative at this meeting.)

Agenda and report of meeting.

Interim report, Strachey's comments, discussions on wording, draft and final version of report (by Strachey, D.J. Wheeler, E.H. Cooke-Yarborough, J. Howlett) on Manchester Electronic Computer Project.

(N.R.D.C. Sub-committee on Electronic Computers Paper 170). This is the MUSE machine. (See C.94)

Working papers, notes and calculations

C.99 'Computer SubCo'.

Mainly Committee papers of N.R.D.C. Sub-committee on Electronic Computers, September 1958-March 1959, bearing on discussions re high speed computers, N.R.D.C. support for and relations with various UK and other computer manufacturers.

Strachey was a member of the Sub-committee until he and Lord Halsbury left N.R.D.C. in March 1959.

In addition, the folder includes memoranda from Strachey on 'Possible Development from the Emidec 2400' (December 1958), 'EMI and Ferranti Proposals for a High Speed Computer' (February 1959), and Lord Halsbury's 'Swan Song' on proposals by E.M.I. and Ferranti (March 1959).

C.100, C.101 2 folders labelled 'Compiler'.

Bundles of notes, calculations and printouts (printouts dated June-October 1958).

C.100 5 bundles.

C.101 2 bundles and loose pages.

probably related to, or developed from, work on fast computer project.

C.102 'Gabor', August-September 1958.

Folder of calculations, printouts, etc. related to new developments in cathode-ray tubes discussed in paper by D. Gabor et al, Proc.I.E.E., 1958; a copy of the paper, and correspondence from Gabor re 'electron-optical computations on flat TV-tube' are included. Probably undertaken as study of cathode ray tube storage re I.B.M. Stretch and high speed computer project.

Working papers, notes and calculations

C.103-C.115 Miscellaneous notes and drafts

C.103 'Notes for papers'.

Folder of miscellaneous material, including plan for projected book 'Introduction to Programming', which was to include discussion of important advances made by projects undertaken during Strachey's period at N.R.D.C. (St. Lawrence Seaway, Flutter, Logical Design, Autocode, etc.).

C.104-C.114 'Numerical Analysis'.

The following folders were all kept together by Strachey under the general heading 'Numerical Analysis etc. Flutter, Codiagonal Methods', though the material refers more widely to various problems on which he worked 1952-59; it also continues to c.1961-62 during his period as a private consultant after leaving N.R.D.C., and especially to his collaborative paper on matrices.

The material may have been assembled for the projected book referred to above.

C.104 'Runge-Kutta'. 1952

Bundles of notes and calculations, perhaps for Manchester Computer, or for Elliott 401 at Cambridge, as follows:

'Runge Kutta. Gill' [Stanley Gill]

'Determining Equations'

'Special case A'

'4th order Complete solution'

'5th order (incomplete)'
Includes a letter from D.B. Gillies.

C.105 'Miscellaneous Maths. Current'.

2 bundles of notes on asymptotic expansions.

C.106 'Linear Accelerator. Maths'.

2 bundles of notes, and extensive loose pages of calculations.

C.107 'L - R
'Q - R'

Miscellaneous notes and calculations.

C.108 'Roots of Tridiagonal. Autocode programs'.

Calculations, routines and printouts (some pages dated May 1958). 5 bundles.

Working papers, notes and calculations

C.109 Program for codiagonal matrix; this is written on ALGOL, probably 1960 and may not be Strachey's work.

C.110 'Polynomials. Roots etc.'.

3 bundles of calculations.

C.111 'Matrix Algebra'. c.1958

8 bundles of calculations and loose pages.

C.112 'Codiagonal Forms in Matrix Eigenvalue Problems'.

Miscellaneous ms. drafts for paper with this title, perhaps early form of that later published with J.G.F. Francis, Computer Journal, 4.

Includes drafts for 'Preliminaries', 'Special Codiagonal Forms', 'Derivation Form', 'Matrix interpretation of analogue of Bairstow process for Codiagonal form', 'Real roots of an unsymmetric matrix', and heavily corrected typed version.

Folder includes 8 pp. ms. note in another hand 'On the automatic choice of 'best' values for the parameters in Tchebycheff iteration', discussing an automatic program written for EDSAC.

See also F.12.

C.113 'Rotated Schwarz. Location of roots on real axis'.

Miscellaneous bundles of notes and calculations on work of Schwarz, Lanczos, and other problems of Codiagonals, Tridiagonals, Polynomials, etc.

(Kept with C.112 above.)

C.114 Miscellaneous notes, some with various dates, 1961, 1962, related to and kept with C.112.

C.115 'Conformal Transformations'.

5 bundles of miscellaneous mathematical calculations on transformations, etc., n.d. but using Pegasus.

Working papers, notes and calculations

C.116-C.135 PRIVATE CONSULTANCY, 1959-1964

Strachey left N.R.D.C. in 1959 and set up formally as a private consultant in June 1959, with Peter Landin as his assistant (see A.44-A.60). While maintaining relations with official work through N.R.D.C. and other committees, etc., he undertook commissions from computer manufacturers on the design and use of computers. Much of the material in the folders below should therefore be read in conjunction with the relevant folders in Section D. Consultancies, to which cross-references are given where possible.

From about 1960 Strachey adopted the (not invariable) practice of date-stamping his notes, and these dates are given in the items below, as well as the titles or descriptions on the original folders. In the case of loose papers, however, it has not always been possible to assign them with certainty to a specific project among the several in which Strachey was often simultaneously involved at this period.

His work on LISP for the EMIDEC 2400 (see C.121-C.135, D.14-D.32) consolidated his approach to the mathematics and semantics of high-level programming languages, and led to his participation in the work of the Cambridge group on CPL (see C.136-C.184) and his Fellowship at Churchill College (see A.61). His private consultancy business was formally wound up in 1964 before his visit to M.I.T. and his appointment at Oxford.

C.116 Royal Radar Establishment All-transistor Computer (RREAC), February-June 1960.

Description and order code of machine, Strachey's comparative notes on its performance, 2 copies of his 'Report on the computer being built at RRE' (2 pp.), 7 June 1960.

C.117 Work on 'Ship Fairings'. December 1960-October 1961. (undertaken at request of N.R.D.C.)

Notes, graphs, calculations, computer printout on Pegasus autocode re problem of fitting the curved end portions of a ship, and Strachey's 'Comments on a Note on Ship Fairing' (2 pp.). n.d. but probably October 1961.

Working papers, notes and calculations

C.118, C.119 Work on Traffic Control, 1960-61.

(Work undertaken in conjunction with N.R.D.C. and Road Research Laboratory.)

C.118 'Traffic'.

Includes: Memos. etc. from N.R.D.C. re collaborative work on the problem with Road Research Laboratory and electronic equipment manufacturers, February 1960.

Ms. and typescript versions of a paper by Strachey: 'Simulation of traffic behaviour on a digital computer', 3 March 1960.

Memo. of Informal Discussion on 'Future developments in traffic signals', held by Institution of Civil Engineers, Traffic Engineering Study Group, 16 March 1961.

C.119 'Traffic'.

Includes: Diagrams and calculations by Strachey, especially on traffic control at junctions.

Copy of a paper 'Traffic simulation programme' for Pegasus, by J.G.F. Francis, June 1961, probably developed from above.

C.120 Miscellaneous papers on ALGOL, 1960-61.

Perhaps assembled for review/comment on paper by H. Rutishauser 'Interference with an ALGOL-procedure' (a copy of which is enclosed) for Review in Automatic Programming.

Folder also includes a copy of 'Towards an ALGOL translator' by Bryan Higman, 1961, with comments by P. Landin and M. Woodger, and an offprint of 'Report on the algorithmic language ALGOL 60' by J.W. Backus et al.

See also F.13-F.16.

Working papers, notes and calculations

C.121-C.135 Work on LISP (LIS + Processing language)

LISP is a computer language based heavily on ALGOL and was put forward by J. McCarthy in 1960.

Strachey's folders of work on LISP below date from 1960 and relate to the development of a LISP-type language for the EMIDEC 2400. Much of the work is entirely mathematical, but there are some narrative sections and a little correspondence.

As work progressed, Strachey seems to have developed other languages, e.g. BL (Basic Language) which he tried out on EMIDEC and other machines (see especially C.134, C.135).

The presentation is chronological as far as possible, but not all the notes are dated.

For further material on Strachey's consultancy with E.M.I. and his work on their machines, see D.14-D.32.

C.121 'L.B. I. Programmes' (LISP Bootstrap).

Notes, calculations and printouts re 'Set up LIST program' on EMIDEC 2400. Various dates June-September 1960.

C.122 'LISP Bootstrap'.

Miscellaneous notes, all lose pages, n.d.

C.123 'EMIDEC 2400

LISP Bootstrap Translator' (L.B.T.)

Notes, calculations and printouts. Various dates July-October 1960.

C.124 'LISP EMI 2400. Machine results etc.'

Mainly printouts, with Strachey's comments on results. Various dates July-October 1960.

C.125 'BL →AL, AL →ML
Assembly and Translation'.

4 bundles of notes, October 1960, on 'Assembly', 'Translation from L.B.I to Assembly coder', 'Temporary Translation of Assembly', 'LB I', and 3 pp. note on 'Structure of List Bootstrap Process' with definition of terms, etc. December 1960.

Working papers, notes and calculations

C.126 'LISP. General functions in L.B.'

Notes and calculations, all loose pages, n.d.

C.127 Miscellaneous bundles of notes, calculations and narrative. Various dates, beginning December 1960, but mainly July and November 1961.

The notes are on list processing, and may be related to the Film Store Test Equipment of the EMIDEC 2400; miscellaneous information sheets and function tables, annotated by Strachey, about the Film Store Test Equipment are included with the notes, and one bundle is headed 'Film Test Store. LISP'.

C.128 'Polynomial Operations'.

Miscellaneous bundles of notes, calculations and narrative, various dates September-October 1961.

These are almost entirely mathematical, one set being headed 'EMI 2400. Restricted Rational Fractions and Integers', related to C.129 below.

C.129 Notes, calculations and printouts, various dates October 1961-February 1962.

Included with one bundle is a letter from Strachey to N. Brown (E.M.I.) October 1961: 'here are the machine language functions and the LISP functions for performing arithmetic on rational fractions'.

C.130 Copy of official Design Specification for machine, compiled by N. Brown, November 1961.

C.131 Miscellaneous narratives and notes, March, April 1962.

On various topics, e.g. time-sharing, control strings, evaluation, etc.

C.132 Draft manual or description for a LISP language.

Tagged folder of notes (various dates May-July 1962), with separate bundles and loose pages of notes (various dates October 1961-October 1962) all kept together, with a note by Strachey added. c.1973: 'LISP-like system. Probably for EMIDEC 2400?'.

Working papers, notes and calculations

C.133 6 pp. typescript note 'Subroutines written for the LISP System', beginning 'In order that programming effort among those interested in the Strachey Lisp system may be coordinated ...' (not by Strachey). n.d.

C.134 'L.B. for Pegasus etc'.

Folder of notes and calculations.

An attempt to test Basic Language (BL) programs on other computers, Pegasus, Orion, Edsac II. Various dates September 1960-February 1961.

C.135 'LIST Progs.'

5 bundles of undated notes:

'Basic Language Structure' (B.L. sometimes L.B.)

'B-List C-List'

'List Program'

'General form of writing List programs'

'Define Macro'

Working papers, notes and calculations

C.136-C.201 CAMBRIDGE UNIVERSITY MATHEMATICAL LABORATORY

Strachey's period of work in Cambridge was relatively short. He joined the Mathematical Laboratory on a part-time basis in 1962 (see A.62) and left to take up an appointment at Massachusetts Institute of Technology in September 1965 (see A.66), subsequently moving to Oxford.

The period was nevertheless an important one in which he participated in major projects, notably CPL, and began work on several other ideas such as the Macrogenerator and formal semantics which were continued later and elsewhere.

The heading has therefore been adopted, partly for convenience but also because it represents a genuine chapter in Strachey's career.

Working papers, notes and calculations

C.136-C.184 CPL

In the Technical Report. CPL Working Papers (C.153) these initials are expanded as Combined Programming Language, thus encompassing both the origin of the project as a joint endeavour between Cambridge and London Universities, and its intention to develop a language with the properties of ALGOL 60 and of a list processing language such as LISP.

The initials are, however, often understood to stand for Cambridge Programming Language, and are so expanded in A. Hyman, Computing. A Dictionary of terms, concepts and ideas, London 1976, where it is defined as 'A specialized programming language of great logical power developed by Christopher Strachey'. Less seriously, CPL was sometimes taken to refer to Christopher's Private Language, reflecting Strachey's major contribution to the work of the team.

Because CPL and its development BCPL originated in Cambridge, all the related papers have been kept together as an entity, although they extend over a much wider spread of time and place, covering Strachey's period at Massachusetts Institute of Technology and his appointment at Oxford, as well as similar comings and goings among other members of the CPL team.

The following remarks and descriptions of the history of CPL are adapted from the Preface to the Working Papers (C.153):

'In October 1962 a joint research project was begun by the University Mathematical Laboratory, Cambridge and the Institute of Computer Science, London (then known as the University of London Computer Unit). The aim of this project was to design and implement a new programming language for use on the Atlas I and II (Titan) computers in the two establishments.

The initial team consisted of D.W. Barron, D.F. Hartley and C. Strachey from Cambridge and J.N. Buxton and E. Nixon from London.

It was intended that the language should possess the advantages of the general structure and precise description of Algol 60 but should be of wider practical utility. Many of its main features were settled at an early stage and were described (in 1963) in a paper on the Computer Journal (C.141, F.24).

Working papers, notes and calculations

The design of the language, as opposed to its implementation, was never more than a part time occupation for any of the authors. As the language gradually approached its present state, the authors' meetings became less frequent and those who were not actively engaged in an implementation found it more difficult to keep in touch with the language. At the same time some of the people who were engaged in an implementation began making substantial contributions to the language itself. During the period 1963 to 1966 D.W. Barron left the CPL language group and D. Park and M. Richards from Cambridge and G.F. Coulouris from London joined it'.

Two versions of an Elementary Programming Manual were produced (C.145 and C.152) and three chapters of an Advanced Programming Manual were written by Strachey (C.147).

In the spring of 1965 the authors decided to prepare and if possible publish a Reference Manual which would contain a complete description of CPL as it then stood. A first draft was prepared by Buxton and was followed by a second by Buxton, Hartley, Richards, Park and Coulouris, each writing one or more sections. This second draft (C.148) was sent to Strachey at M.I.T. for extensive editing and revision (C.149-C.151).

After Strachey returned from M.I.T. the authors held a meeting in Oxford on 24 June 1966 (C.156) at which they decided to publish a Technical Report. This Report (known as the 'Working Papers') would consist of the 2nd edition of the Elementary Programming Manual (C.152) and the revised draft of the Reference Manual which had been circulated in the spring of 1966 (C.151).

The Technical Report (C.153) was the last formal report by the authors although work continued on CPL, especially on compound data structures and segmentation, and on BCPL, devised by M. Richards as a subset of CPL (C.185-C.196), for several years.

Working papers, notes and calculations

The papers are grouped into 2 sections:

C.136-C.157 'Published papers'.

These are any semi-formal papers issued by the group - early Titan programming papers, CPL Bulletins and Circulars, Programming Manuals with Appendices and Supplements, various versions of the Reference Manual and the Working Papers. Included in this section are any drafts and working notes specifically linked to a publication.

Special attention is drawn to C.155, the folder of 35 CPL language papers.

C.158-C.184 Working Papers.

These are the less formal notes, calculations, printout, etc. generated by Strachey and the other members of the team. They are of a very miscellaneous composition and often cover a wide span of dates, owing to Strachey's habit of reworking his files or creating new ones from several disparate subjects. The contents of each folder have been left in Strachey's original order and enumerated as far as possible, although it will be obvious that they are very much interrelated. Cross-references have been given where possible, but do not claim to be complete.

Working papers, notes and calculations

C.136-C.157 'Published Papers'.

C.136 'Programming Language for TITAN', by D.F. Hartley (Titan Programming Paper No.1), 18 May 1962.

C.137 'Provisional Description of Titan for System Programmers', by D.W. Barron, 28 May 1962.

10 pp. in 2 parts.

C.138 'A Survey of Some Programming Languages', by D.W. Barron and D.F. Hartley (Titan Programming Paper No.2), June 1962.

C.139 'A First Outline of the Proposed Cambridge Programming Language', by D.W. Barron, D.F. Hartley and C. Strachey (Titan Programming Paper No.4), 13 August 1962.

C.140 'The Main Features of CPL'.

15 pp. typescript headed 'Second Draft 18.1.63'.

'The Main Features of CPL'.

14 pp. typescript, similar to but not identical with above, intended for circulation within the University of London Computer Unit.

Later revised versions of these papers appeared as Titan Programming Paper No.5 (C.141 below) and as an article in The Computer Journal, 6.

C.141 'The Main Features of CPL', by D.W. Barron, J.N. Buxton, D.F. Hartley, E. Nixon and C. Strachey. (Titan Programming Paper No.5), 26 February 1963.

In an introductory note D.W. Barron explains that the proposals in Titan Programming Paper No.4 (C.139) 'formed the basis from which CPL was developed, in cooperation with the University of London. On 21 February 1963 a Symposium on Development of New Programming Languages was held at London University, and for this a paper called 'The Main Features of CPL' was prepared. This paper is now issued, with corrections, as Titan Programming Paper No.5'.

Also included here is a typescript of the article with same title published in The Computer Journal, 6.

See F.24 for a copy of the published paper.

Working papers, notes and calculations

C.142 'An Introduction to CPL for Titan - Part I', by D.W. Barron, July 1963, with errata lists 1 and 2.

C.143 'CPL Bulletin, Number 1', by D.W. Barron, February 1964, with set of programming examples.

C.144 'Titan CPL Object Code Circular IV', by J.C. Gray, January 1965.

C.145 'CPL Elementary Programming Manual. Edition I (London)', by J.N. Buxton.

C.146 'Appendix II to CPL Elementary Programming Manual', by J.C. Gray, May 1965.

C.147 'CPL Advanced Programming Manual. Drafts'. Various dates, December 1963-September 1964.

Typescript drafts by J.N. Buxton of several sections of the Manual, December 1963 and January 1964.

Duplicated typescript of Manual by J.N. Buxton, June-July 1964, heavily annotated by Strachey.

Strachey's ms. and/or typescript drafts of:

Table of Contents

Items and Types (2.3)

Names, Brackets, etc. (2.4)

Constants (2.5)

Expressions (all of section 3)

Declarations (parts 1 and 2 of section 5)

Numerical Constants (11.2)

Working papers, notes and calculations

C.148 'CPL Reference Manual. Draft I'.

In the spring of 1965 the authors decided to prepare and publish a Reference Manual which would contain a complete description of CPL as it then stood. The first draft was prepared by J.N. Buxton after a series of meetings at which the authors discussed the points at issue. A second draft was then prepared by Buxton, Hartley, Richards, Coulouris and Park, each one writing one or more sections. These were then revised, edited and partly rewritten by Strachey.

This is a looseleaf notebook containing the typescript of portions of Draft I and the whole of Draft II. It is heavily annotated by Strachey with some amendments by Park. This is the copy used by Strachey at M.I.T. when editing and revising the Manual (see C.149 below). The various sections of the draft are dated August-September 1965.

C.149 'CPL Reference Manual. Notes'.

Large looseleaf notebook containing correspondence and notes exchanged between Strachey at M.I.T. and Park at Cambridge (acting on behalf of the CPL authors) re revision and editing of Reference Manual. Over the course of 7 months (the correspondence dates from 28 September 1965 to 16 March 1966) Strachey sent lengthy comments and notes on the draft (C.148 above) which were then discussed by the authors in England and their decision communicated back to Strachey for further revision and editing. Thus a very full record is preserved of the hundreds of decisions (both major and minor) taken by the authors in designing the new language.

The notebook also contains some correspondence exchanged between Strachey and Buxton, mostly concerned with the technical details of publication but also discussing the possibility that M.I.T. might adopt CPL as its chief teaching language for undergraduate courses.

The notes appear in every form, manuscript, typescript, photocopied, stencilled. Most of Strachey's notes bear later ms. annotations recording answers and decisions by the Cambridge and London groups.

The notebook also demonstrates the difficulty in communicating over a long distance on the numerous points in question and the problems raised by the logistics of typing, proof-reading, time lags, etc.

Working papers, notes and calculations

C.150 'CPL Reference Manual. General'.

One folder of material assembled by Strachey for use in editing and revision of reference manual while he was at M.I.T.

Typescript of table of contents with notes by Strachey of progress of each section (draft, typescript, editing, completed, assembled).

Comments by M. Richards and D. Park.

Miscellaneous ms. notes (none dated or titled) by Strachey while formulating revisions.

'Some Linguistic Problems in the Choice of Mathematical Terminology'.

1 p. note by Strachey circulated at M.I.T. asking for suggestions for new words to describe 'a function with no arguments' and 'a function of a variable number of arguments'.

Photocopies of ms. drafts (not in Strachey's hand) of Appendix 1 - Preprocessor, Appendix 2 - Basic symbols in canonical CPL and publication synonyms, Appendix 3 - Standard functions, routines, data items, etc., Appendix 4 - Alternative character sets.

C.151 'CPL Reference Manual. Draft 2, Copy 1'.

Draft as revised and edited by Strachey. Most of the sections are dated November-December 1965 or January-February 1966; these are photocopies of editions produced on the CTSS system at M.I.T. and sent by Strachey to Park on 10 and 28 February and 2 and 16 March. (See C.149 for correspondence relating to the production of this draft.)

The table of contents on p.1 of the draft bears ms. annotations by Strachey to show which sections were missing or needing revision. At a meeting held in Oxford on 24 June 1966 it was agreed 'to make the present second draft of the reference manual available to a restricted audience as a research report from the two Universities'.

It was also agreed that J. Buxton would contribute section 2, D. Park section 9.3 and M. Richards Appendix 1. The typescripts of these sections (dated July 1966) are included in this draft which, annotated and amended by Strachey throughout, became the major part of the 'Working Papers' (C.153).

Working papers, notes and calculations

C.152 'CPL Elementary Programming Manual Edition II (Cambridge)', by J. Buxton, J.C. Gray and D. Park, January 1966. Strachey's annotated and revised copy.

This eventually became the first part of the Working Papers (C.153). The ms. amendments and annotations by Strachey were transferred to the version included in the Working Papers so that the Programming Manual would not have to be re-typed.

Inserted at the back of the Manual is a 3 pp. 'Supplement to the CPL Elementary Programming Manual' by L.J.D. McIntyre, 9 May 1966, which describes the facilities available in the trial CPL system in use at Cambridge.

Included here is a 1 p. note by M.V. Wilkes, 23 May 1966, 'Introduction of CPL for limited experimental use', notifying members of Mathematical Laboratory, Cambridge, that experimental CPL system was available.

C.153 'Technical Report. CPL Working Papers'.

The Working Papers were issued in July 1966 following a meeting of the CPL authors in Oxford on 24 June. They consisted of 2 parts: 1. The second edition of the Elementary Programming Manual (see C.152) and 2. An unfinished Reference Manual (see C.151). The concluding paragraphs of the minutes of the 24 June 1966 meeting (see C.156) state: 'The circulation of the CPL Technical Report will conclude the phase of effort on CPL which has continued for the past four years, and at this stage most authors will probably wish to discontinue their efforts in a formal way ... CPL of course needs major further work, particularly on data structures and program segmentation. C.S. (Strachey) and D.P. (Park) propose to study this at Oxford, and M.R. (Richards) may implement it at M.I.T.' (see C.187).

Strachey's preface to the Working Papers, which gives a useful account of the history of CPL and its documentation, has been heavily drawn upon in preparing the entries for this section of the catalogue.

C.154 'CPL Papers. Manuscript Drafts', July 1966.

Ms. and typescript drafts by Strachey of various sections of the 'Working Papers' (C.153).

Includes: Preface (4 pp.)

Editor's Apologies (3 pp.)

List of Changes Foreseen in CPL (3 pp.)

Table of Contents, Sections 1 and 2 (2 pp.)

Brief correspondence with colleagues re assembling and publication of CPL manuals.

Working papers, notes and calculations

C.155
(continued)

12. 'Notes on where and function definitions, etc.', 10 pp. ms., 5 pp. typescript, Strachey, 24 January 1964.

13. 'Pre-processor Rules and Syntax', 4 pp., Hartley, 2 February 1964.

14. Minutes of CPL meeting, 29 January 1964, 2 pp., Buxton, 7 February 1964.

15. Minutes of CPL meeting, 18 February 1964, 3 pp., Buxton, 2 March 1964. Strachey queries, 'CPL Paper No.15?'.

16. 'Left Hand Functions, etc.', 4 pp. ms., 3 pp. typescript, Strachey, n.d.

17. 'CPL Expressions', 2 pp., J.B.H., 20 February 1964.

18. Minutes of CPL meeting, 25 March 1964, 1 p. Buxton, 15 April 1964.

19. Untitled paper on fn and rt variables, 1 p., Buxton, 21 April 1964.

20. Minutes of CPL meeting, 30 April 1964, 2 pp., Buxton, 4 May 1964.

21. 'The Pre-processor', 2 pp., Richards, 8 May 1964.

22. 'The Application of Left Hand Functions', 2 pp., Strachey, 6 May 1964.

23. Minutes of CPL meeting, 25 May 1964, 1 p., Buxton, 28 May 1964.

'London CPL I/O and Magnetic Tape Facilities', 3 pp., Buxton, 22 May 1964. Not numbered but retained in the sequence by Strachey.

24. Minutes of CPL meeting, 18 June 1964, 1 p., Buxton, 23 June 1964.

25. 'A-lists', 4 pp. ms., 4 pp. annotated typescript, 2 pp. duplicated typescript incorporating revisions, Strachey, 10 September 1964.

26. 'Types of Function Variables', 5 pp., Strachey, 11 September 1964.

27. Minutes of CPL meeting, 3 November 1964, 2 pp., Buxton, 17 November 1964.

28. 'Boolean Expressions', 2 pp. ms., 1 p. typescript, Strachey, 17 November 1964.

29. 'Comment: a Proposal', 1 p., Park, 7 December 1964.

Continued

Working papers, notes and calculations

C.155 (continued)

30. Minutes of CPL meeting, 5 January 1965, 1 p., Buxton, 20 January 1965.

31. Minutes of CPL meeting, 2 February 1965, 1 p., Buxton, 5 February 1965.

32. 'Files and I/O', 3 pp., Buxton, 22 February 1965.

33. Minutes of CPL meeting, 30 March 1965, 2 pp., Buxton, April 1965.

34. Minutes of CPL meeting, 6 May 1965, 2 pp., Buxton, 21 June 1965.

35. Minutes of CPL meeting, 29 June 1965, 1 p., Buxton, 7 July 1965.

C.156 'CPL Meetings, Agenda, Minutes, etc.'

Minutes for the meetings of:

1. 24 June 1966 at Oxford where it was agreed to publish the Working Papers.

2. 1 September 1966.

3. 6 October 1966 where Strachey's draft proposal on compound data structures was circulated (see C.179).

4. 3 November 1966 (includes copy of Agenda).

C.157 2 Papers by G.F. Coulouris on CPL I, April 1965.

Working papers, notes and calculations

C.158-C.184 Working Papers.

C.158 Early working notes on CPL, with reference to ALGOL.

6 pp. note on 'Labels', using the early designation 'result of' instead of the later 'value of'. (All in Strachey's hand.) c.1962.

C.159 Preliminary work for CPL; ms. notes dated 5 July and 9 October 1962.

C.160 'CPL Object Program. TOP 1 and 2'.

Ms. notes and narratives on 'Two main schemes', 'Pointers, B-lines, etc.', 'Formats, etc.'.

C.161 'TOP 1 and TOP 2'.

Folder of notes for preliminary planning of implementation of CPL on Titan. Several sets of notes: 'Scheme 1. Open', 'Scheme 2. Closed. TOP 2 CPL Titan Object Program. Allocation of B-lines, Storage, Parameters, Monitor Numbers, etc.', 'Test TOP 1/1'. n.d. but probably 1962.

C.162 'Compound Data Structures'.

Miscellaneous notes and narratives on lists (December 1962-January 1963), constructors, etc.

C.163 'Co-routines'.

Miscellaneous notes and routines (not all in Strachey's hand). n.d.

Working papers, notes and calculations

C.164 'Dead CPL papers', 1962-64.

One folder of typescripts on points which became outdated or were superseded by later papers and which were kept together in this folder by Strachey. Includes:

'Operating System for Titan', 3 pp., by D.W. Barron, 16 July 1962.

'Titan Operating System - User's View', 2 pp., by Barron, annotated by Strachey, n.d.

'Preliminary Description of the Titan System Program', 5 pp., probably by Barron, n.d.

'Titan System Program: Use of Magnetic Tapes and Core Storage', 2 pp., probably by Barron, n.d.

'Towards the Definition of a Programming Language for Titan. The outlines of the programming language for Titan are now beginning to emerge. The language to be called CPL, is to be based on ALGOL 60. These notes indicate the lines along which ALGOL 60 will be changed and extended', 3 pp., n.d.

'Note on Name or Address Variables', 3 pp. photocopy of ms. draft by Strachey, 12 October 1962.

'Note on Documentation', 1 p. typescript, 19 October 1962.

Typescripts by various members of the CPL team (Nixon, Buxton, Hartley) re definition of CPL, November 1962.

'CPL Syntax - 3/3/63', with ms. note by Strachey 'Out of Date'.

'Implementation of CPL Declarations', 2 pp. typescript, J.H.M., 18 October 1963.

'Titan CPL Compiler. Basic Operations Macros', 6 pp. duplicated typescript by M. Richards and D.W. Barron, 6 January 1964.

Working papers, notes and calculations

C.169 'CPL Compiler
Syntax Condensation'.

Folder of miscellaneous notes and narratives on the implementation of CPL, various dates 1963-65. Includes:

Miscellaneous ms. notes by Strachey, some dated May 1963.

'Condensation Structures and Functions', 15 pp. ms. draft by L.J.D. McIntyre, 16 October 1964.

Typescript of CPL Syntax, 8 February 1965.

C.170 'CPL Programming Examples', 1963.

Miscellaneous drafts and narratives, mainly by Strachey.

'Examples of CDS Programs'

'Tree Sort'

'Examples of CPL [word illegible] and Compiler Language', May 1963.

'Target Strategy Bracketing Program'

'University Mathematical Laboratory, Cambridge. CPL Programming Examples', July 1963

'Permutation in Lexographical Order'

'Preferred type: complex'

'Fast train'

Miscellaneous sets of unlabelled and undated notes and routines, all by Strachey

C.171 'CPL. Formal Semantics'.

Miscellaneous notes and narratives illustrating Strachey's increasing interest in the semantic rather than the syntactic uses of CPL. Various dates 1963-65.

Includes:

'Closures, Functions, etc.', 3 pp. ms., 18 January 1963.

'Semantics of where clause', 2 pp. ms., 30 January 1963.

2 pp. ms. notes on for-loop, 14 March 1963.

'Towards a Formal Semantics', 13 pp. ms. by Strachey, n.d.

'Towards a Formal Semantics', 5 pp. typescript (probably by R.M. Burstall), n.d.

'Basic Ideas', 4 pp. ms. by Burstall, 23 November 1964.

Continued

Working papers, notes and calculations

C.171 (continued)

'Progress? with CPL semantics', 3 pp. typescript, 14 December 1964, with several other pages attached ('Structure Definition of Applicative Structures and Command Structures', 'Functions', 'Translation') that were annotated by Strachey and re-typed on 19 December 1964.

'Some Investigation into the Formal Semantics of CPL', by R.M. Burstall, January 1965. Typescript with ms. annotations.

Chapter I	Dealing with Functions and Routines by the techniques of C. Strachey
Chapter II	First attempts at formalising the translation (p.1 only)
Chapter III	A different approach to CPL semantics, and miscellaneous loose pages of definitions.

Miscellaneous loose pages of notes and narratives by Strachey.

C.172 'CPL Subsets'.

Folder of notes and drafts, October-November 1964.

Includes:

'CPL Subset. Proposed restrictions', 2 pp. typescript by R.M. Burstall, 29 October 1964

'CPL Subset. Proposed semantic restrictions', 2 pp. typescript with ms. annotations by Strachey, 23 November 1964

'Baby (Basic) CPL', 1 p. ms. notes, n.d. This may be the earliest reference to BCPL, with hesitation about its name

C.173 'CPL Object Code Execution System'

Miscellaneous notes and narratives, February-March 1965.

Includes:

'Proposed Scheme for Segmenting CI's and SSR's, 3 pp. duplicated typescript by Strachey, 18 February 1965.

'CPL Compiler Executive System. Tape Titles', 2 pp. duplicated typescript by Strachey with annotations, 5 March 1965.

Various duplicated sheets on 'Teletype Eight-Level Code', 'PDP-7 Instruction Summary', 'Maglayout 1'.

'"Display" etc.', 2 pp. typescript (CW 4)

Continued

Working papers, notes and calculations

C.173 (continued)

Ms. notes on 'Altering a single CI or SSR', 'Construction of Executive System (TOP 2)', 'Steps in setting up an object program', 'Setup and Op. System for Object Code' and various untitled sheets of notes. n.d.

C.174

'CPL Pending (Language and General)'

Miscellaneous notes and narrarives, 1962, 1965.

Includes:

Ms. notes on 'Abstract Objects, Written Expressions, Machine Representations', 28 November 1962.

Notes and queries 'for next CPL Language Meeting', n.d.

3 pp. ms. draft of letter to editor, Communications of the A.C.M. about 'the difficulty of inventing and describing a major programming language', in which Strachey discusses the problems encountered by the CPL team.

C.175

'CPL Programs Linear Algebra'

Miscellaneous ms. and typescript examples using CPL, c.1966.

C.176

'CPL Syntax'.

Miscellaneous notes and narratives headed 'Examples of Scope Rules', 'Juxtaposition and implied multiplications', 'CPL Syntactic Questions', 'Syntax of Nodes and Elements' and 'Syntax of Pointers'. c.1966

C.177

'CPL Reference Manual Working Papers'

Material arising from the publication of 'CPL Working Papers' (C.153).

Includes:

Typescripts of several papers by R.M. Burstall, 18 August 1966:

'Types and Structures', 4 pp.

'Nodes and Elements', 2 pp.

'Extension to Structure Definitions', 1 p.

Duplicated typescript of 'The Switch Command and Lookup Expression', 2 pp., by M. Richards, 6 October 1966.

Typescript of 'Streams' and 'Segmentation'.

Miscellaneous notes by Strachey.

Working papers, notes and calculations

C.178 'CPL Streams'

CPL Memorandum OX1 from Strachey and Park, 3 December 1966, on TrS [In] function.

CPL Memorandum OX2 from Park, 7 December 1966, of 'Comments on CS's Streams'.

Ms. notes by Park and Strachey on streams.

C.179 'Data Structures'.

Miscellaneous notes and narratives on compound data structures, arising from publication of the Working Papers, October-November 1966.

Includes:

1 p. ms. notes of agenda for CPL meeting, 3 November 1966 (see also C.156 for minutes of that meeting).

Ms. notes and typescripts on 'Pointers' (one typescript is dated 31 October 1966).

'Compound Data Structures', 15 pp. ms. draft proposal by Strachey (probably this is the draft that is referred to in minutes of CPL meeting 6 October 1966, see C.156).

5 pp. typescript version of above, Serial no. OX3.

'Examples of CDS Programs', 6 pp. ms. (includes notes on examples).

'Examples of Structures Using Nodes', 3 pp. ms.

'Juxtaposition and implied multiplication', 1 p.

C.180 'Miscellaneous Tech. Chiefly Compound Data Structures'.

One folder of miscellaneous ms. working notes and papers; few are labelled or dated. They are left in the order kept by Strachey and include list of 'Words which are not well understood', 'Some problems in dynamic storage allocation' by M.D. McIlroy, 20 February 1968, 'Compound Structure Type Syntax' and 'Compound Structure Expression Definition', 1965-66.

Notes on streams, nodes, variables, structure definition. Also includes notes for CPL language meeting, n.d. and list of 'Basic Concepts in CPL (in Programming Languages'), n.d.

C.181 Miscellaneous ms. notes and drafts on CPL, some dated June-July 1968.

Working papers, notes and calculations

C.182 'Character Codes'.

Miscellaneous notes and tables, various dates September 1967-February 1968.

Mainly related to attempts to use CPL on Atlas and KDF 9 machines.

C.183 Folder of miscellaneous notes and printout on 'Character set questions', December 1967.

C.184 'CPL. Notes and revisions'.

Folder of miscellaneous notes and narratives, various dates 1966-68.

Includes:

'CPL Working Papers. Suggestions for Amendments and Extensions of the Language', 3 pp. ms. of introduction, lists of amendments, suggestions, and points for discussion.

List of 'Work to Do' (on CPL and BCPL), 12 April 1968, on the reference manual, formal semantics, BCPL, machine design, etc.

'Programmers Parametrically Polymorphic Functions'.

'Proposed Revision of CPL Expression Syntax'.

'Syntax and Grouping' (2 November 1966).

Duplicated set of notes for the revision of CPL, no author or date. Heavily annotated by Strachey.

Miscellaneous loose pages of notes.

Working papers, notes and calculations

C.185-C.196 BCPL

The material in this section includes correspondence on CPL and BCPL (C.185 - C.188), copies of the BCPL Reference Manual (C.189) and Compiler (C.190), and notes and routines by Strachey and the Programming Research Group 1967-73 for BCPL (C.191 - C.196).

The initials BCPL are usually understood to denote Basic Computer Programming Language, though see C.172 for Strachey's alternative expansion Baby CPL.

BCPL was devised by Martin Richards at M.I.T. as an implementation subset of CPL. In a letter to L. Goldthorpe, 3 November 1967 (C.186) Strachey described BCPL as looking 'rather like CPL but is designed to be easy to compile and to make it possible to produce fairly good code'. The original plan had been for Richards to write a CPL compiler in BCPL, but he later decided to concentrate his efforts on improving the BCPL compiler (see C.187). In Oxford, Strachey and the Programming Research Group developed an operating system written entirely in BCPL for their Modular I computer which was delivered in March 1969.

Because BCPL was developed from CPL, it is not possible to make a strict distinction between work on the two languages. The folders below are mainly concerned with BCPL and usually bear Strachey's headings to that effect, but there are numerous references to CPL, and it will have been observed that some folders in the preceding section on CPL contain papers or material on BCPL. Similarly, it has been thought best to leave material on BCPL in the 'Cambridge' period of Strachey's career although the work on BCPL was done after his move to Oxford. For additional material on the Mod. I and KDF9 computers, as well as other projects of the Programming Research Group, see C.208 - C.223.

Working papers, notes and calculations

C.185-C.188 Correspondence on CPL and BCPL, 1966-70.

Includes letters describing plans and research, as well as shorter correspondence re distribution of manuals, requests for further information, meetings and visits, etc. Some are carbon copies only of Strachey's letters.

In chronological order.

4 folders as follows:

C.185 1966 (includes letter to R.F. Churchhouse, 31 May, enclosing 1p. note on 'CPL Compiler', and letter from F.G. Duncan, 10 December, with comments on CPL Working Papers).

C.186 1967 (includes letter from P.J. Landin, 22 January, on data structures, correspondence with C.S.L. Atkinson re use of BCPL for Code Generator for the ICT 1900, carbons of Strachey's letters to accompany copies of his Copenhagen lectures, 'Fundamental Concepts in Programming Languages' (see F.40-F.54), and of letter to L. Goldthorpe, 3 November, describing plans for implementation of CPL and BCPL).

C.187 3 pp. typescript letter, 4 April 1968, from M. Richards at M.I.T., giving reasons for his decision not to write a CPL compiler in BCPL, but rather to improve the 'efficiency and machine independence' of the BCPL compiler. 'I realized that the reasons for using CPLOCODE as the intermediate object code are not valid if BCPL is implemented for its own sake. I have thus chosen to specify and implement an alternative object code which is specifically designed for BCPL'. A printout of an example of its use was enclosed with the letter and remains in the folder. Also included is a photocopy of 'Compilation of Demo BCPL. Not debugged', 5 May 1968, sent by Richards and annotated by Strachey.

The letter also describes the arguments employed by Richards in a paper he was writing on 'rationalizing my views of types'.

C.188 1968-70 (includes letter from A.G. Frazer, 6 February 1968, on data structures, brief correspondence re Modular One operating system, 1969, and on BCPL operating systems OS1 and OS2, 1970).

Working papers, notes and calculations

C.189 'BCPL Reference Manual. Project MAC', by M. Richards, 21 July 1967. 27 pp. stencilled copy.

Includes copy of 'CPLOCODE Language' by M. Richards, 12 March 1967, 8 pp.

C.190 'BCPL Compiler', by M. Richards, 1967.

60 pp. of computer printout annotated by Strachey. The BCPL compiler was itself written in BCPL and was designed to be easily transferable to other machines.

C.191-C.196 Notes and routines implementing and using BCPL, by Strachey and Programming Research Group, 1967-73.

C.191 'BCPL Line Imager. Atlas → Internal.'

Calculations and tables on 'Special characters', 'Internal from Atlas'.

C.192 'BCPL Object Code.
Investigations for Improvement'.

Folder of ms. notes, n.d., and 2 printouts (1967).

Includes:

Printout of User Code Assembly System, 28 November and 1 December 1967, heavily annotated by Strachey.

'Translation of for-loops', ms. notes.

'Collapse entry', ms. notes.

Printout 'Tree Ocode List Run', heavily annotated by Strachey, n.d. (related to work on 'Internal from Atlas' and 'Special characters' above).

Miscellaneous ms. notes and printouts.

C.193 Folder of miscellaneous notes, n.d.

Includes:

'Abstract Syntax of BCPL Declarations', 10 pp. ms.

'BCPL Compile-time Reports', 4 pp. stencilled typescript.

'BCPL Queries', 1 p. ms.

Miscellaneous ms. notes labelled 'BCPL special fns', 'Notation', 'Semantics of BCPL', 'Types in BCPL', 'Useful Functions', and many sets of notes which are not labelled.

Working papers, notes and calculations

C.194 'BCPL/CPL Preprocessor'.

Folder of ms. notes, narratives and routines, some bearing various dates, 1968.

Includes:

'BCPL Preprocessor', 3 pp. ms.

'Recognizers for Lexical Analysis', 11 pp. ms.

'Main Outlines of Preprocessor', 3 pp. ms., 21 May 1968.

'Notes on existing BCPL Compiler', 1 p. ms., 19 May 1968.

'Note on Numbers and Constants in BCPL Compiler', 1 p. ms., 20 May 1968.

Notes on streams, 7 pp. ms., 21-22 May 1968.

'Underlined Words', 10 pp. ms.

'BCPL Canonical Symbols', 8 pp. ms.

Notes on character sets.

3 sets of ms. notes, not titled or dated.

C.195 'BCPL Misc. Notes'.

Folder of notes, including:

'Character Sets etc. in BCPL compiler', 3 pp. ms. (see also C.194 above)

'Optimisation of OCode', 1 p. ms.

'The AE syntax for BCPL', 2 pp. typescript.

'BCPL Formal Semantics' by P. Wallis, 6 December 1973, 33 pp. photocopy of typescript and ms. draft.

C.196 Folder of miscellaneous undated ms. notes, on streams, recursive and non-recursive functions, Tree Streams (by D. Park), etc.

Some of the material, including printout dated 1973, relates to an 'Algol Compiler in BCPL' which was an uncompleted project of the Programming Research Group.

Working papers, notes and calculations

C.202-C.274 OXFORD UNIVERSITY PROGRAMMING RESEARCH GROUP (P.R.G.), 1966-75

See A.68 and Section B for the history and setting up of P.R.G.

The material includes work on the following, as well as on other projects.

C.202 - C.207 Visits and work at Project MAC

C.208 - C.212 KDF9

C.213 - C.223 Modular One (Mod I)

C.224 - C.241 Formal semantics (with D. Scott and others)

C.242 - C.274 Miscellaneous notes and drafts.

Strachey's main interest in the later part of this period, on mathematical semantics and programming theory, was disseminated chiefly through discussions, lectures and talks, or shorter papers, but not by any comprehensive publication during his lifetime (see F.61-F.75).

Much of the work was collaborative with Strachey's colleagues in P.R.G., notably D. Park, D. Scott and J.E. Stoy, and with research students such as R. Milne, C. Wadsworth; contributions from these and others are included in the folders and idenfied where possible.

Guidance from M. Harper and J.E. Stoy on the content and dating of some of this material is very gratefully acknowledged.

Working papers, notes and calculations

C.202-C.207 Visits and work at Project MAC (Multiple-Access Computer, Massachusetts Institute of Technology, 1966-70

Papers and correspondence relating to various visits paid by Strachey to Project MAC to lecture and advise, including reports and professional correspondence re projects, courses, personnel, as well as travel and personal arrangements, etc.

C.202 CTSS (Compatible Time-Sharing System) Programmer's Guide, 1966.

C.203 Correspondence with J.M. Wozencraft re work in progress, personnel, CPL Compiler, etc. at Project MAC. April-November 1966.

C.204 Correspondence and reports, May 1967-July 1968, re Strachey's visit to Project MAC to assess and advise on 'programming linguistics', graduate course, July 1967, with miscellaneous reports on the course and on the visit, and recommendations for revisions.

Contract, travel and visa arrangements, etc. are also included.

C.205 Correspondence, etc. re visit to lecture at M.I.T. in summer session course on 'Programming Linguistics', July 1969.

Includes correspondence on research in progress, travel and financial arrangements, etc.

C.206 Bell Telephone Laboratories.

Invitation to Strachey to visit and lecture at Laboratories during visit to US for M.I.T. Summer Session, 1969.

Includes correspondence on research in progress, travel and financial arrangements, etc.

C.207 Correspondence, etc. re visit to M.I.T. to lecture at second Summer School on Programming Linguistics in July 1970.

Includes professional correspondence on research in progress.

Working papers, notes and calculations

C.208-C.212 KDF 9 1967-69

This was Oxford University's Computer. Strachey used this machine and the Atlas machine at Chilton for various translating and implementation programmes using CPL and BCPL.

C.208 Miscellaneous notes and routines for programming experiments on KDF9, 'line imager', Atlas-ASC II, etc. c.1967

C.209 'KDF 9 Programs'

Miscellaneous notes and routines. c.1967-69

C.210 'KDF 9
Macrocode System. Writeups, etc.' c.1967

8 pp. typescript note on 'Macrocode System for KDF 9', explaining purpose of system and terms used: LUP (Load Update Pair), FVL (Free Variable List), 9 January 1967.

3 typescript notes on aspects of the system.

4 ms. notes, two of them being drafts for above.

C.211 'Code Generator for KDF9. OCode to User Code'.

'User Code Generator for CPL OCode', 8 pp. ms.

25 pp. ms. of program for code generator, n.d.

Numerous sets of ms. notes on code generator.

C.212 'History
BCPL Usercode Generator
KDF 9 Streams'

One folder of stencilled reports; nos. 1-13 are dated June 1969.

1. 'Storage Allocation'
2. 'KDF9 Character Input Stream'
3. 'Temporary Monitor Routine and Error Exits'
4. '8 bit characters (from P702) to KDF9 6 bit characters Input Stream'
5. 'Titan Characters to 8 bit Characters Input Stream'
6. 'Titan 7-bit Input Stream'
7. 'Punch Tape Code to Line Printer Code Output Stream'

Continued

Working papers, notes and calculations

8. 'Blank Output Streams'
9. 'Punch Tape Code to Line Printer Character Stream'
10. 'Device "Streams"'
11. 'User Code Character Output Streams'
12. 'Temporary Merge Output Streams'
13. 'User Code Block Output Streams'
14. 'Line Imager'
15. 'Tab Replaces'
16. 'User Code Generator for CPL Code'
17. No title

Working papers, notes and calculations

C.213-C.223 Modular One (Mod I), 1969-71

This was the P.R.G. Computer, supplied by Computer Technology Ltd. for Strachey's S.R.C. project. The S.R.C. grant was agreed in November 1968 and the machine was delivered in March 1969. Strachey and his team had written a compiler and operating system, using BCPL, and the machine was operating almost at once. This episode is described as follows in 'Getting down to software fundamentals' (included in A.2):

> 'Mod One arrived midday on March 19, and passed its acceptance tests that evening. Less than 48 hours later they had the whole lot working.'

C.213-C.215 3 sets of tagged ms. notes and test printouts for Mark I and Mark II Intercode for the Modular One machine.

Most of the notes are date-stamped January and February 1969.

C.216 'Set up Bootstraps'.

Looseleaf ring binder of ms. notes and routines, almost all in Strachey's hand, but with some later material by D. Park, P. McGregor. Strachey's notes are dated January-February 1969.

The material is divided as follows:

'Set up General'

'Bootstrap I'

'Bootstrap II'

'OS1 Set up'

The notes by Strachey are designs for programs to load the P.R.G's Operating System (OS1) into the Modular One Computer from paper tape. They are in 'Written IC' (Interpretive Code, designed by Strachey in the sets of notes in C.213-C.215) for Bootstrap I and Bootstrap II, Tape 1, and in BCPL thereafter. There is later material from other members of P.R.G., as this was an active working file until at least 1971.

(Information supplied by M. Harper of P.R.G.)

Working papers, notes and calculations

C.217 Tagged folder of stencilled notes, information and routines kept as a manual for Modular One. Various dates, 1969-71.

C.218-C.220 Work on 'Exec. I', 1969-70.

'Exec. I' was the Executive program supplied by Computer Technology Limited with the P.R.G.'s Modular One machine. CTL would not supply the text of the Assembly Code program, so Strachey produced an unannotated listing from the Assembled binary tape.

C.218 'Modular I. Exec.I'.

Bound folder of program, with some ms. annotations. n.d. c.1969.

C.219 Miscellaneous ms. decoded and annotated sections from CTL's Exec. I program, produced by Strachey from the unannotated listing, to see how it worked. n.d. Probably 1970.

C.220 Miscellaneous ms. notes, all re decoding and annotating of CTL's Exec. I program, some with dates March-April 1970. One technique for describing what a particular subroutine did was to write an 'equivalent' BCPL routine, and there is a 2-page narrative note describing conventions to be used when doing so.

(Information supplied by M. Harper of P.R.G.)

C.221 'Stream Compiler'.

Miscellaneous bundles of notes and routines, all in Strachey's hand, some dated December 1970-January 1971, on the design and implementation of the 'Stream Compiler' which was a new compiler for BCPL to run on the P.R.G.'s Modular One System. The work was being done by one of Strachey's D.Phil. students (Alan C. Bamford) under his direction.

(Information supplied by M. Harper of P.R.G.)

C.222 Printout headed 'Russian Problem', December 1971. (Program for the 'Stream Compiler')

Also included are printouts for 'Factorial' program and of part of the 'Stream Compiler' itself, and other notes and printouts, 1972-73.

Working papers, notes and calculations

C.223 Strachey's Original Specification for an 'Off-Line Job Queue' for the P.R.G.'s Modular One computer, dated 28 May 1971.

This program served as a 'batch processor' for programs held in a queue. [A version of the program is still in use (January 1978)]

(Information supplied by M. Harper of P.R.G.)

Working papers, notes and calculations

C.224-C.241 Formal Semantics (in collaboration with D. Scott and others) including λ- Calculus (C.237-C.240).

C.224 'Notes for Book on Math. Th. of Comp.'

Plans, chapter headings and notes for book 'A Mathematical Theory of Computation', to be written by Scott and Strachey. The plan and chapter headings are in Scott's hand; comments, notes and drafts for sections of the work are by Strachey. Various dates August 1969.

The book was not completed, but many of the notes and calculations in the following folders were preparatory material for the project.

C.225 'Various formal prog. languages'.

Notes and ideas on types of languages, some by Scott but mainly by Strachey.

Includes:

'Language O'

'Language 1' (see C.228 below)

'Mini-language 1', February-March 1970

'Language 2. Assignment and Hops'

'Language 3. The simple procedure language', by Scott and Strachey

C.226 'Paradigm Prog. Lang. (PPL). Version 1' (by Scott and Strachey).

'P.P.L. Version 2' (by Scott and Strachey).

Kept with C.225.

C.227 Shorter notes:

'Languages' (possibly outline for work to be done for projected book)

'Algol 60' (on verso, 'Language O')

'L-PAL'

'A purely applicative language'

'Commands or expressions'

'Simple programming language with side effects'

Kept with C.225.

Working papers, notes and calculations

C.228 'Mathematical Semantics for two simple languages'.

Duplicated typescript of paper read by Scott and Strachey (on Language O and Language 1) at Princeton, August 1970.

C.229 'Jumps, etc.' 1970

Sequences of notes and routines (collaborative work with Scott).

'A small "Continuation" language' (typescript note, basis of the work)

'Program Segments', calculations and narrative, 2 items both April 1970

'Jumps, Hops, Labels', more extended sequence of calculations and narrative, April 1970

'Commands/Jumps Semantics'

'Examples of Hops, Skips and Jumps (approx. PAL)'

'Attempts at Jumps'

'Jumping Into and Out of Expressions', 3 pp. narrative by Strachey dated August 1970, ms. and typescript versions.

C.230 'Data Types in Programming Languages'.

2 ms. drafts for work, perhaps lecture, with this title, July 1970.

C.231 'General Notes on Series Typographical Expts.'

Notes and examples of symbols for computer languages, in various type-faces, in connection with planning and publication of P.R.G. Technical Monographs, 1970-71.

Includes letter to Scott on the subject, March 1970.

C.232 'Formal Semantics Miscellaneous work more or less in progress'.

Bundles of notes, calculations and narrative, various dates March 1969-February 1972, with headings or titles as follows:

'Basic Functions'

'Conditional Expressions'

'Simple language without side effects'

'Sample Class 2 language (derived from PA)'

Continued

Working papers, notes and calculations

C.232 (continued)

'Abstract syntax'

'Stored Commands'

'Lists and Polyadic functions'

'Commute'

'Example (2nd Loop th.)'

'Loop Theorem I'

'Notation'

'Simplification of fixed point results'

'Assignment method for recursion'

'Dijkstra's Problem' (2 sets, February 1972 and earlier work, March 1970)

'Induction'

Untitled (on Dijkstra)

C.233 Undated notes and calculations by Strachey on same subject (kept with above).

C.234 Notes and ideas by R. Milne, S. Linfoot and other members of P.R.G. (kept with above)

C.235 'Formal Semantics
Formulae
Theorems
Exercises'

Tagged set of 'Miscellaneous Formulae' in Strachey's hand, various dates March 1970-March 1971.

C.236 'Useful formulae and equivalences' (by C. Wadsworth, annotated by Strachey).

Miscellaneous problem sheets, etc. by D. Park, J. Stoy and others (kept with above).

C.237 ' λ- Calculus and models'.

Includes paper by D. Park, and miscellaneous notes by Strachey, some dated December 1970.

C.237A 'Lattice Theory. Misc. Notes'.

Bundles and loose pages of notes by Strachey, Scott, Park, and handout for lectures on Lattice Theory.

Includes 'Revised version' of Park's paper 'The Y- Combinator in Scott's λ- Calculus Models' and a copy of his covering letter to Scott, October 1970. Various dates, 1970.

Working papers, notes and calculations

C.238 ' λ -Calc.'

Includes extended narrative by Strachey ' λ - Calculus as a language. Contains details of proof of correctness of substitution lemmas etc. in the model', December 1970.

6 bundles of notes and calculations by Strachey, R. Milne, C. Wadsworth.

C.239 'Dana Scott's LAMBDA and Simplified universal domain'.

Copy of Scott's paper 'A simplified construction for λ- Calculus Models' delivered at Uppsala, April 1973.

Extensive notes and comments on above by Strachey.

Various dates, May-June 1973.

'Subsets of $P\omega$', notes by Scott (Trinity Term 1973).

C.240 Various notes and problems on λ - Calculus, perhaps for course of lectures, annotated by Strachey, 1973.

Correspondence with P. Welch 1975 re a problem arising from the lectures.

C.241 Folder of research material on programming languages and miscellaneous problems, by members of P.R.G. and others, sent to Strachey or kept by him as background information. Mainly 1972.

Includes reports and papers on research in progress by R. Milne, C. Wadsworth (P.R.G.); extended correspondence between D. Scott and R. Milner, 1972, on λ - Calculus and lattice structures; notes on 'Jump-free PAL' by S. Linfoot (P.R.G.).

Working papers, notes and calculations

C.242-C.274 Miscellaneous notes and drafts

C.242, C.243 'An Abstract Model for Storage'.

See G.34

C.242 'A.M.S. Manuscript. 1st Draft'.

Ms. and first typed draft with ms. corrections for Introduction and Chapter I of work with this title, July 1971.

C.243 'An Abstract Model for Storage'.

Folder of notes, plans and calculations, some under title 'An axiomatic model of storage', a few by Scott but almost all by Strachey. Various dates June 1970-May 1971.

C.244 'Notes on "call by name" and "call by value"'.

Notes and papers, probably taken for, or at, discussion meeting at P.R.G. n.d. c.1970-71.

C.245 'OS6. Text and some notes'.

Notes and calculations on 'Free Store Package' and vectors, with test printouts, dated October-November 1971.

For P.R.G. in-house seminar on 'Style in Programming' which discussed examples of bad programming style found in the OS6 system.

(Information supplied by M. Harper of P.R.G.)

C.246 Folder for 'Bug file' and other notes, 1972-74.

The idea of the 'BUG FILE' was that all the members of P.R.G. would analyse (and record) their program bugs so that causes of mistakes could be recognised. Unfortunately most people (including Strachey) only kept their file for a week or so, and nothing came of the idea.

(Information supplied by M. Harper of P.R.G.)

C.247 'Bit Streams'.

Notes and printout, October-November 1972.

Working papers, notes and calculations

C.248 'Console Experiments'.

Folder of miscellaneous material on programming and use of P.R.G.'s computer; includes a few notes and programs by Strachey, and some notes and reports by other members of P.R.G. Various dates, 1972-74.

C.249 'Machine Design'.

Notes, calculations and drafts on ideas for computer design, various dates, 1971-72.

Includes:

'Possible I.C. Machine', 24 February 1971.

'Design of Large Computer Systems', 5 pp. ms. draft, possibly draft for paper or recommendation.

The sub-heading is 'Sequel to Time-sharing in Large Fast Computers' and suggests that the reduction in cost of hardware means that time-sharing is no longer desirable except in small-scale console systems on local small computers. n.d.

Untitled similar draft on machine design, n.d.

'Notes on Very Large Projects', 5 pp. photocopy of ms. draft, with a note 'Notes not used at Conf. on Undergraduate Curriculum in Comp. Sci., Univ. of Waterloo, 2-3 October 1972'.

See H.32.

C.250 Miscellaneous notes and calculations, perhaps also for ideas on machine design, on 'Hops', 'Stack machine' (1972), 'Squasher Table' (for BCPL), etc.

C.251 'Design of new programming languages'.

Miscellaneous notes for talk or paper to answer questions 'Why? How? What for? What?', 6 March 1973.

C.252 'Manifest Functions'.

Includes notes on 'Manifest functions' and also other notes on language design headed:

'Language I', June 1973

'Error exits from functions and routines', August 1973

'Dynamic type checking', n.d.

Working papers, notes and calculations

C.253 Miscellaneous bundles of notes, calculations and narrative, mainly on 'Conditional Expressions', and various 'Models of Store'. Various dates, latest December 1973.

C.254 Miscellaneous narratives, notes, calculations, routines and printouts, mainly connected with an Anagram program which Strachey was developing, 1973-74.

C.255 Ms. questions and problems on formal semantics and concepts in programming languages, devised for section 'Theory of Programming Languages' in Honour School of Mathematics, Oxford, June 1974.

C.256 Miscellaneous notes and calculations on semantics, some dated March 1974.

C.257 Miscellaneous routines and test printouts. Mainly for 'Recipes' program, possibly intended to test ideas on compact storage of information, and some general P.R.G. computer documentation, March-April 1975.

C.258 'Misc. Programming Notes and Tricks'.

Folder of miscellaneous material, mainly on self-reproducing programs devised by Strachey and others in P.R.G. Includes a sequence of notes by Strachey on 'Recursive Routines and Loops'.

C.259 Miscellaneous undated notes, some for programs, some for problems and puzzles. Various periods to 1972.

C.260 Miscellaneous notes and narratives, perhaps for talks or papers on various problems, e.g. store, recursion, continuation language, domains, etc., some dated 1972 and 1973.

C.261 'Notes on various topics'.

Includes:

'On models', ms., perhaps for short talk, 5 pp., November 1974.

'Thoughts about Syntax', ms. 1 p. n.d.

'The Axiom of Choice', n.d.

Working papers, notes and calculations

C.262 'Misc. notes for papers, articles, etc.'

Includes:

'Notes on self-teaching programs', 1 p. with note, M.I.T. 1966.

'Abstraction in Programming Languages', 1 p. notes

'Numerals', 2 pp.

Plan for publication on philosophical foundations and methods of language programming, under 17 headings with notes on contents, 7 pp. n.d.

'Logical Structure of a Small Operating System', 3 pp.

'The Structure of Operating Systems', 4 pp.

C.263-C.274 Teaching and research material, 1968-75.

This material came to hand at a late stage in the preparation of the catalogue. Its inclusion here as an addendum unavoidably breaks the chronological order roughly preserved in the preceding entries.

C.263 'Misc. semantics'.

Typescript and ms. notes on various topics, by Strachey and other members of P.R.G., 1969.

Includes two tagged bundles of notes by Strachey, on 'ALGOL Formal Semantics' and 'Types and other Manifest attributes'.

C.264 'Seminar on formal semantics. Mich. 1969'.

Ms. notes by Strachey on D. Scott's seminar on formal semantics given at Oxford, November 1969. Includes some teaching material distributed by Scott.

C.265-C.267 'Style in programming', 1969-73.

Notes, exercises and examples for courses at Oxford.

C.265 1969-72

C.266 Mainly 1970

C.267 1972-73

Working papers, notes and calculations

C.268-C.270 Undergraduate Computer Course, 1968-73.

Notes, exercises and examples for vacation courses on programming, at Oxford.

C.268 Examples and exercises, September 1968.

C.269 Material for a course on 'Introduction to Computing', September-October 1972.

C.270 Material for 'Undergraduate Computer Course', September 1973.

C.271 'Logical Hardware Lecture Notes, Hilary 1971'.

Tagged bundles of notes and narratives, and miscellaneous exercises and problems, bearing various dates 1971-74.

C.272 'Handouts (Technical)'.

Folder of ms. and duplicated material, notes and examples on semantics, λ- calculus, etc., probably for teaching.

C.273 Miscellaneous ms. notes and narratives, various dates March 1974-March 1975.

C.274 Tagged bundle of notes on 'Outline of Processes of Computation', January-February 1975.

With some loose pages of diagrams on same subject headed 'Abstract Process of Computation' and 'Concrete Process of Computation'.

SECTION D CONSULTANCIES D.1 - D.109

Most of the material dates from 1959-64, when Strachey was in practice as a private consultant; some antedates this period (see D.82 - D.84 for advice requested while Strachey was still teaching at Harrow), and several firms maintained an arrangement, whether on a formal or an ad hoc basis, for several years after the formal winding up of the practice.

Though industrial firms form the major part of those involved, Strachey was also consulted by universities, research establishments and official bodies such as National Research Development Corporation.

The material is presented alphabetically. It may consist of formal and financial agreements, arrangements for visits and meetings, working notes, research material and reports, and should be read in conjunction with items in Section C relating to e.g. work on E.M.I. and Ferranti computers, and with the index.

Consultancies

D.1 University of Adelaide Computing Centre.

Exploratory correspondence re project to write 7090 FORTRAN translator for CIRRUS computer at Adelaide. Strachey was willing to undertake the project in conjunction with A.S. Douglas of Corporation for Economic and Industrial Research, and a costed plan was submitted. The project appears not to have developed. May 1962

D.2 Bank of Ireland.

Brief correspondence re advice on use of Computer for Bank of Ireland. March 1963

D.3 Burroughs Corporation.

Brief correspondence and note of meeting, July-September 1962.

D.4 C.A.V. Limited. January 1961-February 1963

Strachey was recommended to the firm by Lord Halsbury, and acted as consultant for them in devising and supervising acceptance tests for their new Leo III computer.

Folder includes correspondence re meetings, working papers and routines, programme and schedule of acceptance tests, notes and memoranda on meetings and discussions, reports on 6 days of acceptance tests, publicity leaflet issued on formal acceptance of the machine.

D.5 Computer Technology Limited.

Brief correspondence re possible consultancy arrangement, and also re exchangeable disc for Mod. I at P.R.G., October-November 1973.

Correspondence re proposal for Minicomputer Industry in Europe, 1974.

D.6 Corporation for Economic and Industrial Research (C.E.I.R.).

Note by Strachey of visit from President, C.E.I.R. (H.W. Robinson) re possible consultancy. 1960.

Brief correspondence with A.S. Douglas re NIGEL project, 1962.

Included with the folder is a letter re possible consultancy with I.B.M. 1958.

Consultancies

D.7-D.9 Computer Analysts and Programmers Limited (C.A.P.)

Strachey became a Director in 1963, resigning this title on his appointment to Oxford in 1967 but remaining a shareholder and 'Consulting Fellow'.

2 folders of general correspondence with directors and officials re Strachey's association with the company, statements of account and dividends, appointments, etc.

D.7 1962-64 (includes draft brochure of company's services).

D.8 1965-74

D.9 Correspondence with M. Dan Oestricher re visit to Strachey's P.R.G., Oxford, and Strachey's comments on a note to appear in C.A.P. Views about research in progress at P.R.G. 1973

D.10 University of Edinburgh Department of Electrical Engineering.

Strachey acted as Consultant to J.V. Oldfield in his research project 'A visual display system for dynamic design'; a copy of the research proposal is included.

Brief correspondence re project, and high-speed data links required. 1964-65

D.11-D.13 Decca Radar Limited

Strachey acted as consultant on the design of a digital data processor (D.D.P.) for the firm.

D.11 Tagged folder of correspondence re consultancy arrangements and fees with members of Computer Division, Decca Radar, including advice by Strachey on planning and personnel of programming section. June-November 1961

D.12 Tagged folder of Strachey's notes, calculations and routines, various dates May-August 1961, with duplicated background information sheets from Decca Radar Ltd.

D.13 Ms. and corrected typescript versions of Strachey's 'Preliminary Report on the Choice of an Order Code for the D.D.P.', June, 'Supplementary report on the Choice of an Order Code for the D.D.P.', July-August, and 'Final Report on the Choice of an Order Code for the D.D.P.', September 1961.

Consultancies

D.14-D.32 Electric and Musical Industries Limited (E.M.I.).

Strachey was retained as a consultant by E.M.I. from June 1959. The Computer Division of the firm was bought out by International Computers and Tabulators Ltd. (I.C.T.) in 1962; Strachey continued his consultancy (then for I.C.T. Product Planning Division) until 30 November 1963.

See Section C for further notes and working papers related to various E.M.I. projects, LISP, and high-speed computers.

D.14 Tagged folder of general correspondence with officers of E.M.I., April 1959-June 1964.

Includes:

Consultancy arrangements

Commission to report on EMIDEC 1100 (March 1960) and EMIDEC 2400 and 3400 (May 1960)

Letters to N. Brown re Strachey's LISP functions (October 1961)

Commission from E.M.I. Electronics Ltd. 'to develop an ALGOL compiler written in a machine independent language' (June 1962).

EMIDEC 1100

D.15 Miscellaneous information sheets re Emidec 1100, and miscellaneous notes by Strachey on machine and on administrative structure.

D.16 'EMIDEC 1100 Programs'.

Miscellaneous ms. notes and routines.

D.17 'Postmortem routine'.

Various notes and printouts headed 'Postmortem' (not in Strachey's hand), various dates July 1959, March 1960.

D.18 'Report on a study of the Emidec 1100' (addressed and sent to Mr. C. Metcalfe in answer to his letter of March 1960 (see D.14)

Typescript and ms. draft, 26 pp., final version 17 pp., May 1960.

Consultancies

EMIDEC 2400

D.19 Program Input Routine (Part 3 of EMIDEC 2400 Data Processing System). Background material sent to Strachey for information.

D.20 2 Samples of data processing programs in use on EMIDEC 2400, sent to Strachey for information and referred to with misgiving in his report (see D.24 below).

D.21 'Current 2400 Programs'.
Miscellaneous ms. calculations and routines by Strachey.

D.22 'Current EMI 2400'.
Similar material.

D.23 'EMI 2400 Completed programs'.
Similar material, on Floating Point.

D.24 'Report on the EMIDEC 2400, September 1960'.
Ms. notes, plans and drafts, first typescript with ms. revisions 11 pp. + 2 pp. addendum, typescript final version 9 pp. + 2 pp. addendum.

EMIDEC 3400

D.25 E.M.I. duplicated memoranda on Fast Computer and development of Emidec 3400, February, April, November (2) 1959; undated table of comparison of Emidec 2400 with I.B.M. 7070.

D.26 Strachey's notes and calculations, mainly on administrative and financial matters, staffing for 1100, 2400, 3400, etc. (kept with above).

D.27 E.M.I. duplicated memoranda, progress reports, etc. on 3400, including 'Proposals for the development of a new high speed computer', May 1960, and Progress reports May, June, August, September, October 1960.

D.28 Strachey's ms. notes and drafts on 'Dynamics' and 'Geodesics'. n.d. (kept with above).

Consultancies

D.38 English Electric Company Limited.

Brief ms. notes by Strachey on English Electric DEUCE Computer Manual, 1956.

Brief correspondence 1961.

D.39, D.40 Evershed and Vignoles Limited, 1961.

Strachey submitted a report to the firm on a statistical analyser.

D.39 Ms. plan and draft of report, and final typescript version, October-November 1961.

D.40 Miscellaneous ms. notes, diagrams and calculations for the above, July-September 1961.

D.41-D.81 Ferranti Limited.

Following his resignation from N.R.D.C., Strachey acted as private consultant to Ferranti Ltd. 1959-62, with special responsibility for the development of an autocode for the ORION computer. Strachey's assistant Peter Landin was principally engaged on this work under Strachey's guidance. The final report, scheduled for February 1962, was not formally completed.

The Computer Department of Ferranti Ltd. was sold to I.C.T. in 1963. Because few records survive elsewhere for the Orion project, the memoranda, research papers, manuals and company material circulated to Strachey by the firm, have been retained.

D.41 Correspondence with Ferranti, 1959-62.

Includes negotiations re consultancy, signed Agreement for 'the preparation of an autocode for scientific work on the Orion Computer', schedule and provisional outline of report on Orion Autocode November 1961-June 1962, termination of consultancy as from November 1962.

D.42 Miscellaneous correspondence 1961 re despatch of manuals and Company literature, company conferences, etc.

Includes correspondence re data transmission links.

D.43 Folder of correspondence exchanged with P. Landin as Strachey's assistant with responsibility for Orion Autocode, 1960-63.

Includes technical correspondence, invitations to and reports on conferences or meetings attended by Landin vice Strachey, comments on drafts of proposed manuals, and notes by Strachey and Landin for their Autocode Manual, September-October 1961.

Consultancies

D.44 Material on Mercury Autocode Programme, 1956-62.

Mainly duplicated papers, notes of meetings, etc. on Mercury Autocode and its extension to programs for Orion and Atlas.

Includes papers and Autocode Bulletins 1-3 by R.A. Brooker, and Ferranti papers: Extended Mercury Autocode on Orion and Atlas, November 1961, and Addendum to above, February 1962.

D.45 Miscellaneous ms. and typescript notes and working papers for programs on Orion project (not in Strachey's hand). Some dated March-April 1961.

D.46, D.47 Departmental memoranda, technical notes; minutes and notes of meetings and discussions on various aspects of Orion design, extension of Mercury autocode to Orion, etc. attended by Strachey or sent to him for information.

D.46 6 October 1960 - 30 December 1960.

D.47 6 January 1961 - 4 October 1963.

D.48-D.81 Official research papers and drafts prepared for or circulated by Ferranti Computer Department on various aspects of design and programming of Orion; some with annotations by P. Landin.

In date order, 1959-62.

D.48 Orion System (publicity booklet), 1959.

D.49 Ferranti Orion. Provisional Order-Code, July 1959, 'with some amendments inserted by P. Landin (especially for times) 6/4/60'.

D.50 Ferranti Orion Data-Processing System. Provisional description, August 1959, annotated by P. Landin.

D.51 Ferranti Orion Data-Processing System. Description of a provisional Program-Input routine, annotated by P. Landin, March 1960.

D.52 The Orion Nebula. A brief description of the proposed commercially oriented language for Orion, 28 March 1960.

D.53 Ferranti Orion Data-Processing System. Organisation and Monitoring Program, April 1960.

Consultancies

D.54 Orion. Proposed Scheme for Program-Input, (diagram with note by P. Landin on verso, April 1960).

D.55 Ferranti Orion. Provisional description of a symbolic input routine, with corrections and revisions by P. Landin, April 1960.

D.56 Ferranti Orion. Provisional Description, 2nd edition, April 1960.

D.57 'A preliminary note about the execution on Orion of Mercury autocode programs that include machine orders', by P. Landin, 4 May 1960.

D.58 Ferranti Orion. Primitive Input scheme, July 1960.

D.59 Ferranti Orion. The built-in programmes, November 1960.

D.60 Ferranti Orion. Provisional Description, 4th edition, January 1961.

D.61 Amendment to above, March 1961.

D.62 Ferranti Orion. The built-in programs, 3 January 1961.

D.63 Draft of Portion of Chapter XIII of the Nebula Programming Manual, 31 January 1961.

D.64 Ferranti Orion. Programming Exercises (machine coding), 6 March 1961.

D.65 Ferranti Orion. Examples of complete problems for programming, 14 March 1961.

D.66 Ferranti Orion. Examples of the Use of the 101 Output Conversion Instruction, 22 March 1961.

D.67 Ferranti Orion. Two simplified problems relating to Insurance Office Work, for programming, 24 March 1961.

D.68 Ferranti Orion. A simple program 'Special Factorize', n.d. [March 1961].

D.69 Ferranti Orion. Description of Card Readers, Card Punches and Line Printers, 7 March 1961.

D.70 Ferranti Orion. Two sample complete programs, May 1961.

Consultancies

D.71 Ferranti Orion. Sorting time graphs, June 1961.

D.72 Ferranti Orion. Programming Exercises (addendum to D.64), 11 August 1961.

D.73 Ferranti Orion. Description of Card Reader, Card Punch and Line Printers (revised version of D.69), 26 January 1962.

D.74 Ferranti Orion. A Fortran Compiler for Orion, 16 January 1962.

D.75 Ferranti Orion. Data Input System. Specification, 1 August 1962.

D.76 Ferranti Orion. Data Input System. Specification (revised version of above), 22 October 1962.

D.77-D.79 3 copies of Draft 'Orion Autocode - Users' Handbook', 70 pp. + 4 pp. Index, October 1961.

All copies bear annotations, comments, deletions, etc. by P. Landin, 'CMP', G.E. Felton, and Strachey.

D.80, D.81 Orion Programmers' Reference Manual, Vols. 1 and 2.

2 Ring-backed looseleaf binders of programs and instructions bearing various dates 1961-63, and many annotations and corrections in several hands as above.

D.82-D.84 Foster Brothers Limited. 1950-51

Strachey was recommended to this firm by a mutual acquaintance, during his period at Harrow School.

The firm, which manufactured tapered steel poles for telegraph lines, required formulae for the calculation of stress loads vertically and horizontally.

D.82 Correspondence re problem and Strachey's progress with it, June 1950-May 1951.

D.83 Notes, calculations and graphs on the problem, many on verso of class exercises at Harrow.

Ms. and typed versions of Strachey's report 'Calculation of test loads for tapered tubular poles'.

D.84 Miscellaneous drawings, diagrams and specifications sent by Foster Bros. to Strachey and with his annotations, additions, etc.

Consultancies

D.85 Glyndebourne Festival Opera, 1965.

Correspondence re possible use of computer for Glyndebourne Opera bookings.

D.86-D.90 International Computers and Tabulators Limited (I.C.T.)

Note: I.C.T. bought E.M.I. Computer Division in 1962 and Ferranti Computer Department in 1963, and became International Computers Limited (I.C.L.) in 1968.

Strachey became a consultant in 1963, his contract being renewed periodically to May 1965 when he left for M.I.T. He resumed his consultancy in July 1966.

D.86 Correspondence on consultancy and renewals, 1964-65.

Includes one letter on Mercury Auto Code, 1960.

D.87 Correspondence on consultancy, visits, etc., and on disc store, 1966.

D.88 Correspondence re Basic Language Machine.

Includes I.C.T. draft manual, with comments and annotations by Strachey, January 1967.

D.89 Correspondence re 1908 computer design, June 1967.

D.90 Correspondence re meetings and projects, 1968-71, especially re Interactive Programming System and user methods.

Includes reports and papers.

D.91-D.96 Mullard Equipment Limited. 1961-65

Strachey was appointed Consultant to the firm from December 1961 for four years, to work in 'the field of telegraph switching'. He terminated the consultancy in 1965 when winding up his existing consultancy business before leaving for M.I.T.

D.91 General correspondence re consultancy, including copy of Agreement, 1961-65.

D.92 Correspondence, memoranda, etc. re meetings and projects, mainly on Electronic Telegraph Switching, and patents on 'Memory Systems' arising therefrom (1962). Some briefer correspondence on Parcel Conveyor Control (1964) is included.

Includes 2 reports by Strachey, 7 March 1962: 'Electronic Telegraph Switching. Draft Proposals' and 'Parallel Access to a Drum'. November 1961-November 1964.

Note: Fuller correspondence, drafts and information on Patents was kept in a separate file (D.95 below).

Consultancies

D.93 Brief notes and working papers by Strachey on Electronic Telegraph Switching project, December 1961- March 1962.

D.94 'Mullard Equipment. Working Notes'.

Tagged folder of notes and routines for the Electronic Telegraph Switching project, various dates January-February 1962. This is the full record of Strachey's work on the project, and the basis of his summary reports in D.92, an extra copy of which is included here.

D.95 Correspondence, drafts, amendments, etc. re patenting of 'Improvements in or relating to information storage systems' (joint inventors were Strachey and Peter Swift of Mullard) Patent Application 19287/62. PHB 31100, on Drum Storage; Patent Application PHB 31141 (inventor Strachey) on Random Access to Drum Store. March 1962-August 1964

D.96 'Logarithmic Calculator'.

Ms. and typescript drafts for a paper with this title, prepared for Mullard Ltd. and dated 17 August 1961. (This antedates Strachey's formal consultancy with the firm, but was kept with the later material.)

D.97-D.99 National Institute for Research in Nuclear Science ATLAS Computer Laboratory, Harwell.

Strachey was appointed Consultant to ATLAS Computer Laboratory, initially for one year from September 1962, the appointment being renewed in 1963 and 1964. On his appointment at Oxford he continued to serve as member of the Extramural Research Panel.

Correspondence re meetings, research projects, appointments, publications of books or reviews, miscellaneous proposals for ATLAS laboratory.

3 Folders as follows:

D.97 1962-63.

D.98 1964.

D.99 1966-70.

Consultancies

D.100-D.103 National Research Development Corporation (N.R.D.C.), 1959-62.

See also A.39-A.42, C.27-C.115.

Strachey ceased work as a full-time salaried employee of the Corporation in March 1959. From 1 June 1959 he entered into an Agreement with the Corporation to work for it as a private consultant for a specified number of days in each of the three years to 1962. The Agreement was renewed in May 1962 for a further six months, covering the period June-December 1962.

Some of the material in Section C relates to commissions undertaken for N.R.D.C. under this Agreement; see especially work for Royal Radar Establishment, on Ship Fairings, Traffic Control and EMIDEC, and Strachey's tabulated chronicle of his activities in D.103.

D.100 'N.R.D.C. Agreement and correspondence relating', 1959-62.

Strachey's tagged folder, including drafts of agreement, final 'Deed' as signed 1 June 1959, and letter of renewal for six months from 1 June 1962.

D.101 'N.R.D.C. Pension Fund'.

Strachey's tagged folder of miscellaneous correspondence, 1959-61 re above.

D.102 'N.R.D.C. General Correspondence' 1959-62.

Strachey's tagged folder of correspondence and reports exchanged with Michael A. Wright (Strachey's successor with responsibility for computer activities at N.R.D.C.) on various projects with which Strachey was concerned.

They include:

Letter re LIST structure problems, August 1960.

Strachey's report on 'Information Processing Languages', in particular LISP, 5 pp., February 1961 (see also C.121-C.135).

Plans for conference and meetings in USA, February 1961.

Correspondence on Ship Fairing, November 1961 (see also C.117).

Computer Patents, August-September 1962.

Consultancies

D.103 Tabulated chronicle of activities, 1960-62. 3 pp.

With 1 p. to a year, this gives, in very compressed form, a complete breakdown of Strachey's work and allocation of his time as between N.R.D.C., E.M.I., Decca, Mullard and other projects for the 3 years 1960-62.

As in A.6 a considerable amount of information is encapsulated in small compass.

D.104 Rio Tinto Management Services (U.K.) Limited.

Correspondence, notes of meetings and discussions re possible use of computer for ore-bed and other mining assessments in the Company's work. October 1960-July 1961.

D.105-D.108 Siemens Edison Swan Limited. 1958-60

Papers relating to Joint N.R.D.C./Siemens Computer Project, in which Strachey was one of N,R.D.C. representatives; the project became A.E.I./N.R.D.C. project from 1 January 1960.

Mainly committee papers, progress reports, etc. re 405 Computer.

D.105 Agendas and Minutes of Progress Meetings, October 1958, January, March, May, June, July, August, October, November, December 1959, January, February, March, August 1960.

D.106 Memoranda and reports prepared for Progress meetings by N.R.D.C. and Siemens, some written or annotated by Strachey.

Includes:

Paper, 4 December 1958, by C.R. Merton outlining history of the 405 project, and future policy.

Paper, 8 December 1958, by Strachey on 405 project and future policy.

Schedules for acceptance tests and reports on machine's performance. November 1958-August 1960

D.107 Miscellaneous duplicated notes and schedules for machine. Various dates, January-June 1959.

D.108 Looseleaf ring-binder of specifications, preparation sheets, etc. prepared by Siemens for the machine, 1959.

D.109 Solartron Electronics Group

Brief correspondence and working notes on project for 'Eurocontrol Radar Simulation', 1962-63.

SECTION E COMMITTEES AND SOCIETIES E.1 - E.63

The material is presented in alphabetical order of name of committee or organisation.

Committee and background papers have been included when they deal with projects in which Strachey played a major part.

E.1 Association for Computing Machinery, British Chapter. 1968-72.

The British Chapter was formed in 1968.

Correspondence, papers re organisation of the Chapter, minutes of 2 meetings.

E.2-E.4 Automatic Programming Information Centre (A.P.I.C.)

A National Conference on Automatic Programming held in Brighton, April 1959, recommended the establishment at Brighton Technical College of a National Centre of Information on Automatic Programming - to maintain a comprehensive library of the literature in the field and to publish an annual review. Strachey served on its Advisory Committee; the Organising Secretary was R.H. Goodman.

E.2 Notices and minutes of meetings of the Advisory Committee, correspondence, especially re relationship between British Computer Society and A.P.I.C. 1959-61.

See also E.10.

E.3 Correspondence with R.H. Goodman, mainly re Strachey's and P. Landin's requests to borrow or have photocopies of articles from the A.P.I.C. library. Some correspondence re reviews by Strachey or Landin for publication in A.P.I.C. bulletin is also included.

E.4 Correspondence, 1965, with R.H. Goodman re possible publication of Strachey's paper on a general purpose macrogenerator in Annual Review in Automatic Programming. The paper was published in The Computer Journal, see F.32.

Later correspondence and papers re future of Annual Review following the death of R.H. Goodman, 1967.

Committees and societies

E.5-E.20 British Computer Society (B.C.S.)

The Society was founded in 1957.

Strachey served on many of its committees and study groups, and as Chairman 1959-62 of the Committee on Scientific Programming Languages. He also contributed papers to The Computer Journal, and acted as referee for manuscripts submitted for publication.

He was made a Distinguished Fellow of the Society in 1971.

For other material re conferences or projects sponsored by B.C.S. see the general index.

E.5 Miscellaneous papers and correspondence re activities of B.C.S. (conferences, discussion meetings, Annual General Meetings, etc.) 1959-62, 1972-75.

Mainly printed material, but includes correspondence re proposed European Computer Society (ECI). Conference planned for Amsterdam 1976 for which Strachey was to serve on the Programme Committee.

E.6 Correspondence and papers re Strachey's membership in the B.C.S., his appointment as a Distinguished Fellow (1971) and re his membership of I.F.I.P. Working Groups 2.2 and 2.3. 1968-75

Correspondence for 1968 refers to the Extraordinary General Meeting of the Society in March to consider revision of articles of membership.

E.7 Correspondence and papers on 'Non-Numerical Analysis', 1961-62.

In October 1961 The Computer Journal (Vol.4, No.3, p.212) published an article by L. Fox called 'Computing Machines for Teaching and Research' which elicited a lively correspondence in the Journal re the validity and importance of non-numerical analysis. Strachey and S. Gill replied immediately to Fox 'Your stirring article which has just appeared in the Computer Journal was obviously intended to cause controversy and we have risen to the bait'. They wrote a lengthy letter which was published in Vol.4, No.4, January 1962, and which was answered by Fox in the same issue. In this second

Continued

Committees and societies

E.7 (continued)

letter Fox offered to organise a Summer School in Oxford in 1963 'on "Non-numerical applications", "Artificial intelligence", or whatever title is thought desirable, at which Gill and Strachey and other workers in these fields could give us the benefit of their knowledge'. This became the very successful Summer School on Advances in Programming and Non-Numerical Computation. (See H.11, H.12 for correspondence and papers re this School).

Folder does not contain a copy of Fox's original article, but includes:

Typescript, stencilled typescript and proof of Strachey's and Gill's letter.

Typescript and stencilled copy of Fox's rejoinder.

Correspondence between Strachey, Gill, Fox and E. Mutch (Editor of the Journal).

Photocopies of numerous letters sent to the editor of the Journal and passed along to Strachey, Gill and Fox (these letters have not been indexed).

Copy of interesting, lengthy letter from Gill to the editor, 18 January 1962, re philosophical 'background' to the controversy.

E.8-E.10

B.C.S. Committee on programming notation, 1958-62.

In July 1958 the British Computer Society established an Advisory Committee on Standardization of Automatic Coding Notation to formulate suggestions for a uniform programming language for scientific problems. The Committee went through numerous changes of name: it became the Research Committee on Scientific Programming Notation in December 1958, the Committee on Scientific Programming in November 1961 and the Committee on Scientific Programming Languages in February 1962. S. Gill served as Secretary of the Committee throughout its existence and Strachey served as Chairman from October 1959 until the Committee was disbanded in July 1962. The B.C.S. established a Standard Programming Languages Committee which held its first meeting on 13 February 1962 and on which Gill and Strachey served. No material relating to this committee survives here.

Committees and societies

E.8 Research Committee on Scientific Programming Notation.

Includes:

Minutes of meetings 1-22 (21 July 1958-1 May 1962).

Agenda for meetings 2-22.

Committee on Automatic Coding for Business Problems (the parallel committee to the Scientific Committee).

Minutes of meetings 1-4 (31 March 1959-6 November 1959).

E.9 Folder of drafts for papers produced by the Committee, 1959-62.

Includes:

'Suggestions for Notations': 6 pp. ms. and 4 pp. typescript draft by Strachey, 26 February 1959, considered by the Committee at its meeting on 3 March.

'Towards a Common Programming Language'. 3 typescript drafts of paper by Gill describing the aims of the Committee and including examples drawn from Strachey's notes (above). 3 pp., 4 pp. and 5 pp. drafts, all annotated by Strachey. The final version was published in the Computer Bulletin, vol.3, no.1, April 1959.

Typescript draft (5 pp., annotated by Strachey) of paper on layout of cycles and on operators (probably prepared by H.H. Robertson with M. Woodger), 29 June 1959, published in the Computer Bulletin, vol.3, no.3.

'Notations for Subroutines', 5 typescript drafts of paper on this subject (4 pp., 5 pp., 7 pp., 7 pp., 8 pp., all annotated by Strachey). The last one bears extensive comments by P. Landin.

'Some notes on the use of auxiliary subroutines', 2 pp. draft by D. Wheeler, 2 pp. note by Strachey, 19 February 1960, commenting on Wheeler's draft, 2 pp. 'Some further notes on the use of subroutines', 31 March 1960, annotated by Strachey and Landin.

Committees and societies

E.10 Folder of correspondence and papers re the work of the Committee.

Topics include:

Proposals of Association for Computing Machinery and the German Association for Applied Mathematics and Mechanics on standardization.

ALGOL and the November 1959 meeting in Paris.

The Automatic Programming Information Centre in Brighton.

An Expanded Alphabet.

Notification of meetings.

Disbandment of the Committee, etc.

Much of the material consists of carbons of letters written by Gill on behalf of the Committee or of photocopies of letters received. 1958-62.

E.11-E.13 Working Party on a Travelling Computer for Schools, and computers in education. 1961-63

This was originally an independent working party chaired by R.H. Tizard to explore a proposal by Strachey that a small computer be mounted in a lorry and taken round to schools for demonstrations, lectures and practical experience. The Working Party was later sponsored by the British Computer Society.

E.11 Correspondence re proposals, correspondence with school masters re feasibility of the scheme (their replies were uniformly favourable), and with the School Mathematics Project.

E.12 Minutes and notes for meetings.

Numerous drafts of explanatory proposals and papers re above.

Extracts from replies and comments by schools re the proposal (see correspondence in E.11).

Strachey's ms. notes.

Estimates of costs. 1962

Committees and societies

E.13 Miscellaneous material relating to the teaching of computation in schools and examinations at A-level in the subject, 1963

Proposals, sample examination papers, correspondence re meetings to discuss project.

See F.29, F.30, H.10 for further material relating to computers in education.

E.14, E.15 Study Group on Artificial Intelligence and Simulation of Behaviour (A is B).

Following a one-day symposium on A. is B held at Northampton College of Technology in September 1964, Strachey joined a committee to further the project. The other members were D.E. Broadbent, I.J. Good and D. Michie, and the Secretary was M.B. Clowes until December 1965, when the position was filled by R.M. Burstall.

The B.C.S. encouraged the project with publicity and a small financial grant.

E.14 Correspondence re project, 1964-65.

Includes first Newsletter.

E.15 Correspondence 1966-69.

Strachey resigned from the Committee in June 1969.

Includes some correspondence on CPL.

E.16 Joint Mathematical Council.

Strachey succeeded M.V. Wilkes as B.C.S. representative on the Council from July 1974.

Brief correspondence re appointment.

Background material re Council.

E.17 Miscellaneous reports by Strachey on mss. submitted for publication in the Computer Journal, 1961-70.

E.18 Miscellaneous reviews by Strachey for the Computer Journal and the Computer Bulletin, 1960-67.

E.19 Miscellaneous correspondence arising from publications by Strachey in the Computer Journal, especially re 'An Impossible Program' published as a letter to the Editor, January 1965, 7.

Committees and societies

E.20 Invitation to lecture to various B.C.S. groups and branches, 1957-73.

E.21 British Standards Institution Panel on Punched Tape Coding.

Committee papers, drafts of British Standard for Codes for Punched Tapes, with comments by Strachey and C.R. Merton, N.R.D.C., and others.

Strachey's ms. notes, July 1959-September 1960.

Committees and societies

E.22-E.31 Department of Scientific and Industrial Research (D.S.I.R.). Working Party on Computer Science

Note: This material should be consulted in conjunction with that relating to the Science Research Council (S.R.C.) (E.42-E.63) which developed from D.S.I.R.

Following proposals by D.L.J. Perkins of I.C.T. and his correspondence with Sir Philip Morris, a meeting was called for 31 July 1962 under the Chairmanship of Sir Harry Melville (Secretary, D.S.I.R.) 'to discuss a proposal that a school of Computer Science or Computational Philosophy should be founded' (E.22). It was agreed to appoint a Working Party to review the current use of computers in research and to recommend proposals for further research.

The Working Party, which was Chaired by L. Howarth, held its first meeting on 23 October 1962. Strachey was invited to act as its consultant (E.23), his main task being to review previous work and research in progress in UK (E.29-E.31) and to present reports to the Working Party (included in E.26, E.27).

The final report of the Working Party was issued in April 1964 (E.28).

E.22 Preliminary correspondence and papers.

Includes invitation to meeting, copies of proposal by D.L.J. Perkins (June 1961) and subsequent correspondence, list of those invited to meeting on 31 July 1962 and Note of its decisions.

E.23 Correspondence re Strachey's appointment 'to act as consultant and expert adviser' to the Working Party, conditions of appointment, termination of agreement with effect from 1 April 1963. August 1962-May 1963.

E.24 Correspondence re Strachey's paper on 'Computers and University Research', written 26 June 1962, which was circulated to the Working Party and appeared as Appendix II of its final report, April 1964.

A copy of the paper is included.

E.25 Papers for Working Party meeting, 23 October 1962.

Committees and societies

E.26 Papers for Working Party meeting 26 January 1963.

Paper 8 is Strachey's 'Report on computer science in the U.S.A.', Paper 9 is his 'Report on computer science in the U.K.', Paper 11 is a memorandum from M.V. Wilkes and Strachey.

E.27 Papers for Working Party meeting 26 March 1963.

Paper 14 is Strachey's 'Note on Present Position', Paper 15 is the report on his enquiry on 'Current Computer Research in England', Paper 16 is a Memorandum by Strachey 'in my private capacity'.

E.28 Minutes of meetings.

Drafts of final report, April 1964, which recommended support for Wilkes's and Strachey's proposals for a research group at Cambridge.

Letter of thanks for participation.

E.29 Material collected by Strachey for his enquiry into current research.

In February 1963 Strachey circularised numerous universities and researchers who made 'unusual' uses of computers in their work. He sent out 63 queries which elicited 35 replies by 15 March (the date on which he prepared the report); several replies were received subsequent to that date.

Folder includes a copy of Strachey's original letter, a list of those circularised, Strachey's ms. notes and a copy of his report on the enquiry (4 typescript pages; circulated as paper 15 of the Working Party - see E.27).

Strachey numbered each reply as it was received and they are presented in this order. He also numbered correspondingly the names on the mailing list and thus this list serves as a useful index to the material.

See E.30 for replies to letters received by D.M. MacKay on this subject.

E.30 'Notes'.

Ms. notes by Strachey on visits to research projects in UK, for memoranda for the Working Party. Includes photocopies of letters sent to D.M. MacKay from workers in various UK universities, passed on to Strachey for information. 1962-63.

E.31 Miscellaneous correspondence on visits by Strachey, research projects in UK and overseas, etc.

Brief routine correspondence re Working Party, 1962-63.

Committees and societies

E.32 Department of Scientific and Industrial Research, Research Grants Committee.

Strachey was appointed to the newly-constituted Computing Science Sub-committee of the above in October 1963. The Chairman was Lord Halsbury.

Letter of appointment and brief correspondence re first meeting of the Sub-committee on 18 November 1963.

Committee papers on support for computer research, heavily annotated by Strachey who describes one as 'a quite deplorable paper calculated to put irrelevant bureaucratic difficulties in the way of anyone trying to start anything interesting in computer research. It should be resisted'. Various dates November 1963-March 1965.

E.33 Diebold Research Program - Europe, Advisory Committee, 1970-72.

Strachey was invited to become a member of the Advisory Committee when it was formed in 1971.

Correspondence and committee papers.

E.34 European Association for Theoretical Computer Science, 1972-73.

This Association was formed in 1972 and held its first meeting in Warwick, March 1973.

Brief correspondence re Association and meeting.

Committees and societies

E.35-E.41 International Federation for Information Processing (I.F.I.P.), 1962-75.

Miscellaneous material relating to I.F.I.P. conferences and activities, and in particular to Working Group, 2.2. (Programming Languages) and 2.3 (Programming Methodology) on both of which Strachey served.

E.35 Symposium on Advanced Computer Organization, I.F.I.P. Congress, Munich, 27 August-1 September 1962.

Strachey did not attend the Congress.

Prospectus.

Correspondence re invitation to Strachey to be one of the speakers (invitation declined; David Wheeler was the UK representative).

E.36 Formal Language Description Languages, I.F.I.P. Working Conference, Vienna, 14-18 September 1964.

Programme, list of participants, correspondence.

Strachey contributed a paper on 'Towards a Formal Semantics' which was not published until 1966 in Formal Language Description Languages for Computer Programming, ed. T.B. Steel Jr., North Holland. Strachey described this paper as 'the beginning of a mathematical (as opposed to operational) approach to formulating the semantics of a programming language'.

See F.31

E.37 I.F.I.P. Working Conference on Symbol Manipulation Languages, Pisa, September 1966. Sponsored by Technical Committee No.2. Strachey chaired one of the sessions.

Folder includes invitation, programme, list of participants, information re arrangements for the conference, 4 pp. typescript by Strachey 'of what I would have liked to say' for publication in the proceedings (on a 'tree sort', in CPL).

E.38 Miscellaneous papers and correspondence re I.F.I.P. meetings.

Technical Committee No.2 Working Conference, Oslo 1967, on 'Simulation Languages'.

I.F.I.P. Congress, Edinburgh, August 1968.

Continued

Committees and societies

E.38 (continued)

Technical Committee No.2 Working Conference, Norway, August 1973.

Technical Committee No.2 Working Conference, Hungary, September 1975.

E.39

I.F.I.P. Working Group 2.2.

In 1967 Technical Committee No.2 (Programming Languages) established 'a working group on the problem of formal language description languages for the purpose of creating some order in the area of describing programming languages for digital computers'. Strachey served as a member of this working group from its inception.

Correspondence, lists of members, notices of meetings, discussion of topics to be covered. See also Strachey's correspondence with S.R.C. re grants to attend the meetings in B.10. 1967-74

Strachey's 'Fundamental Concepts in Programming Languages' appeared as Paper 1 in Bulletin no.1 issued by the Working Group 20 February 1969. (See F.40-F.54).

E.40

Folder of Strachey's notes on technical papers and questions for discussion at W.G. 2.2 meeting, Copenhagen, July 1968.

Includes 3 pp. typescript 'Some Features of Programming Languages', notes on types, 1st and 2nd class objects, L and R values, sequencing, definitional structure, etc. and copy of Strachey's letter to D. Scott, 3 September 1969.

E.41

I.F.I.P. Working Group 2.3

At its meeting in October 1969 the I.F.I.P. General Assembly authorised the establishment of a Working Group on Programming Methodology. Strachey served as a member of W.G. 2.3 from its inception. See note by M. Woodger, Chairman of W.G. 2.3, 22 December 1969, on the origin and background of the Working Group.

Correspondence, lists of members, notices of meetings, agenda, informal minutes (including extensive sets of informal notes by the chairman) of 1st meeting, Copenhagen, March 1970 (17 pp.) and 8th meeting, Munich, December 1974 (62 pp.).

See also Strachey's correspondence with S.R.C. re grants to attend the meetings in B.10.

Committees and societies

E.42-E.63 Science Research Council (S.R.C.)
Computing Science Committee. 1965-74

Strachey had been a member of the Computer Science Sub-committee of the Research Grants Committee of the D.S.I.R. since its inception (see E.32).

When this was disbanded and the S.R.C. was established he was invited to become a member of the new Committee (from 1 October 1965 to 1968). During his service he visited various university research teams and continued to referee grant applications for research in the field.

E.42 Letter of invitation to serve on the Committee, correspondence re meetings and visits, Committee papers, letter of thanks on termination of service, 1965-68.

Some similar correspondence is included in B.10.

E.43 'Software workshop', 1966-68.

Strachey's tagged folder of papers and correspondence re the establishment of a national software workshop/research centre.

Draft papers were prepared by D. Michie and Strachey (June-September 1966) and were discussed at various meetings with colleagues. See also the Minutes of the Committee for 21 February 1967 when the workshop was discussed (included in E.42).

The folder includes various drafts for discussion papers, notes of meetings and proposals for action.

See B.17 for similar material.

E.44 S.R.C. Working Group on Computer Education, 1966-67.

Strachey and N.S. Sutherland were asked by the Computing Science Committee to prepare a paper 'embodying members' criticisms of the Report' of the Working Group.

Strachey's tagged folder includes correspondence and comments by other members of the Computing Science Committee, drafts of Strachey's and Sutherland's paper, final agreed copy of Computing Science Committee's comments and of Mathematics Committee's comments.

Committees and societies

E.45 Long-Range Computing Research Policy Panel, Computing Science Committee, S.R.C. 1970-71

Includes:

Committee papers and correspondence.

Reports on 2 special meetings for the Panel, at Edinburgh on 28 October 1970, on artificial intelligence, and in London on 8 December 1970 on programming theory and the theory of computation.

First draft of 'Final Report of the Long Range Computing Research Policy Panel', February 1971, heavily annotated by Strachey.

Correspondence on forecast of future research developments, 1971.

E.46-E.63 Reports on grant applications, research projects, visits to laboratories, research teams, etc., 1962-74.

17 folders in chronological order.

E.46	1962-63
E.47	1964
E.48	1964
E.49	1965
E.50-E.53	1966
E.54	1967
E.55	1968
E.56	1968
E.57	1968
E.58	1969
E.59	1970
E.60	1971
E.61	1972
E.62	1973
E.63	1974

SECTION F PUBLICATIONS, REVIEWS, REPORTS & PAPERS F.1 - F.76

Most of the bibliographies and lists of publications prepared by Strachey in his lifetime were incomplete or selective, omitting early works or those which he considered to have been superseded by developments in the subject and in his own field of interest. The list below therefore includes several items which do not appear in the various bibliographies in A.3.

Many of the items comprise working notes, correspondence, background or research material, and examples of the extensive drafts, consultative comments and redrafts to which Strachey - for whom formal academic writing was reputedly a chore - submitted his work.

The items are presented chronologically and cross-references are given where possible to related material in other Sections of the collection. See especially the introduction to Section H for a list of talks, papers and contributions by Strachey at conferences, symposia, etc. and which are included in that Section.

Publications, reviews, reports and papers

F.7 'On Taking the Square Root of a Complex Number', The Computer Journal, 2.

Offprint.

F.8 Paper on 'learning programmes'.

2 drafts (not identical), dated April 1960, of comments and discussion by Strachey on ideas for self-organising programmes by Mr. Maine and Dr. Ross Ashby.

F.9 'Initial Definition of Interpreted Functions'.

2 drafts, variously dated October and November 1960 (perhaps related to work on List Processing Language).

F.10 'Two Contributions to the Techniques of Queuing Problems', The Computer Journal, 3, July 1960.

Ms. draft, correspondence with editors and colleagues re paper, revisions and corrections, corrected proof, offprint of published paper.

F.11 'The Characteristics of Computers of the Second Decade', discussion meeting of British Computer Society, held at Northampton College, September 1960. Computer Bulletin, March 1961.

Strachey opened the first general discussion session, and made several contributions to the discussion.

Offprint of proceedings.

F.12 'The Reduction of a Matrix to Codiagonal Form by Eliminations', by Strachey and J.G.F. Francis, The Computer Journal, 4, July 1961.

Ms. drafts of paper, correspondence with editor, offprint of published paper.

See also C.112, F.5.

F.13, F.14 2 folders of notes, routines and correspondence on use of an ALGOL program to reduce a matrix to a codiagonal form. Based on program outlined in F.12 above.

F.13 'Real Eigenvalues on EDSAC'.

Notes, routines and printouts, some with notes and comments by M.V. Wilkes, various dates April 1961.

Typescript of paper on 'Real Roots of an Unsymmetric Matrix', 5 pp., March 1961.

Publications, reviews, reports and papers

F.14 'ALGOL Programs
Codiagonalisation
Derivative Form
Real Roots'

5 bundles and loose papers of notes and routines on above topics, various dates, March-April 1961.

Includes correspondence from M.V. Wilkes expressing satisfaction with the use of ALGOL for these problems.

F.15, F.16 'Some proposals for improving the efficiency of ALGOL 60' (with M.V. Wilkes), Comm. ACM, 4, November 1961.

A paper linked to F.13-F.14 above, first published as Technical Memorandum 61/5, 29 July 1961, of University Mathematical Laboratory, Cambridge.

F.15 Miscellaneous ms. plans and drafts for paper, including comments by P.J. Landin, various dates June-July 1961.

A copy of Technical Memorandum 61/5 is included here.

F.16 Correspondence with collaborator, colleagues and editors re publication of paper and reactions to it. May 1961-February 1962.

An offprint of the published paper is included here.

F.17-F.19 Shorter publications, reviews, reports, 1959-62.

The numbers in square brackets indicate a numbering system used by Strachey, not corresponding to chronological order, or including his major papers.

F.17 Comment on Genie. An Intermediate Range Assembly System, 20 July 1960 [9].

Report on Chorofas: 'Advanced Programming Systems', 12 October 1960 [10].

Letter to Editor, New Scientist, on 'Computers and Decision Making', 16 February 1960 [11].

Review for Computing Reviews, 20 July 1960 [12].

Press-cutting of Art Buchwald's interview with Strachey in New York, N.Y. Herald Tribune, 19 June 1959 [13].

Ms. draft paper on 'Automatic Programming', n.d. [14].

Publications, reviews, reports and papers

F.18 Copy of The Times Supplement on Computers in Commerce, 4 October 1960 [15].

Review by Strachey of 'Annual Review in Automatic Programming', ed. R. Goodman. (Contains the papers presented at the Brighton Conference, April 1961, see E.2), several drafts and versions, January 1961 [16].

'Bitwise Operations', 3 pp. with 3 pp. calculations, for Communications of the A.C.M., January 1961 [17].

Review of P.H. Nidditch, 'Elementary Logic of Science and Mathematics', 24 January 1961 [18].

Ms. solution to problem in New Scientist, 7 March 1961 [19]. See also A.72.

F.19 Review of C.V.L. Smith, 'Electronic Digital Computers', for Computing Reviews, 11 July 1961 [22].

Review of J.E. Whitesitt, 'Boolean Algebra and its Applications', for Computing Reviews, 11 July 1961 [23].

Review of 'The Logical Design of STRETCH', ed. W. Buchholz, ms. and typescript versions, May 1962 [28].

Review of Cooper, 'Formal Differentiation of Algebraic Expressions', 8 February 1962 [30].

Review of G.L. Hollander, 'Drum Organisation for Strobe Addressing', for Computing Reviews, [31].

Offprint of report on Zurich Conference on ALGOL with ms. note by Strachey, 'This is one of the early papers on ALGOL and in fact refers to ALGOL-58. It is now of historical interest only'. [32].

Review of K.E. Iverson, 'A programming language', for Computing Reviews, 1962 [33].

F.20 Association of Computing Machinery.

Correspondence with editors re Strachey's contributions to Computing Reviews and Communications of A.C.M.

Includes reviews and reports by Strachey, various dates 1960-62, 1966, 1973-74.

Publications, reviews, reports and papers

F.21 Ms. and typescript notes on 'Use of Computers', perhaps for talk given at Manchester College of Science and Technology, or prepared for B.V. Bowden, Principal of College.

Includes 2 letters from B.V. Bowden, September 1961 and November 1962 and printed background material, including script of talk 'From Hunch to Science', by Barbara Wootton, broadcast 20 February 1962.

F.22 'A new tool of the intellect', The Observer Weekend Review, 18 February 1962.

Ms. draft of article, revisions and corrections, editorial correspondence and correspondence with readers of article, press-cutting of article as published.

F.23 Contributions to Discussion meeting of British Computer Society, 18 April 1962.

Reprint from The Computer Journal, 5, 1962.

F.24 'The main features of CPL' (by Barron, Buxton, Hartley, Nixon and Strachey).

Reprint from The Computer Journal, 6, 1963.

See also C.141.

Publications, reviews, reports and papers

F.25-F.30 Reports, notes and correspondence on computer research in British industry and universities, prepared on various occasions, 1962-65.

F.25 'Computers and University Research'.

Includes:

2 drafts (June 1962) of a paper prepared at the request of P.M.S. Blackett, and later circulated as a paper for D.S.I.R. Working Party on Computer Science.

See E.22-E.31

Correspondence with Blackett and H. Jones re feasibility of establishing a research team in computing theory at Imperial College.

'Proposed Group to Study Mathematical Aspects of Computer Use', 4 pp. typescript annotated by Strachey 'Gill's proposals to Imperial College'.

Copy of application to D.S.I.R. by H. Jones for grant to investigate 'the mathematical basis of computer programming', and copy of letter withdrawing application.

1 p. untitled note by Strachey, 27 June 1962, on mathematical theory of information processing, with ms. note by Strachey 'submitted to Churchill College'.

2 pp. 'A project for investigation' by P.J. Landin, 29 June 1962.

F.26, F.27 'The Computer Industry'.

A paper prepared by Strachey at the request of P.M.S. Blackett, based orginally on a Report from E.M.I. Research Laboratories, by W.E. Ingham and L.F. Broadway, but developed into a comparative survey of the Computer Industry in UK and America, with proposals.

F.26 Correspondence, including invitation to write paper, list of those to whom it was circulated, and comments from them (includes 2 pp. typed comments from S. Gill).

A copy of the E.M.I. Research paper is included here.

F.27 Ms. draft, typescript and duplicated versions of paper, 9 June 1964.

Research material with comparative performance figures, press-cuttings, etc.

Publications, reviews, reports and papers

F.28 'The Future of Computers in Great Britain'.

Several ms. drafts of paper prepared by Strachey for B.V. Bowden, January 1965, on the use of small computers for teaching purposes in schools.

Folder also includes copy of 'Tentative Plan for a National Computer Authority' by S. Gill, September 1964, sent to Strachey for information; correspondence with Bowden and C.P. Snow; correspondence and information re Digital Equipment Corporation to whom Strachey had written for information re their PDP 8 Computer and its suitability for teaching purposes; copy of 'The Government, The Computer Industry and Computer Technology in the United Kingdom', by W.S. Elliott, 16 February 1965. (Section 5: Computers and Computer Courses for Schools and Colleges draws on Strachey's papers 'The Computer Industry', June 1964 (F.26 above) and the paper prepared for Lord Bowden above.)

F.29, F.30 Work on Computers for Schools, 1965.

F.29 Carbon of note by Strachey 'Computers in Great Britain' (on computer education) sent January 1965 from Churchill College, especially on use of PDP8 for the purpose, and related correspondence.

F.30 Ms. (untitled and undated, but probably prepared for above scheme) of information about computing, devised for school children and introducing competition 'to arouse interest in electronic computers and in the process of writing programs for them', accompanied by problems for solving.

See E.11-E.13, H.10 for other material on computers in education.

F.31 'Towards a Formal Semantics'.

Paper submitted at I.F.I.P. Conference, Vienna, September 1964.

Typed draft with ms. corrections and revised version dated July 1964, ms. list of errata and references.

Offprint of paper from conference proceedings ed. T.B. Steel, North-Holland Publishing Co., Amsterdam, 1966 (includes discussion of paper at conference).

See E.36.

Publications, reviews, reports and papers

F.32 'A general purpose macrogenerator', The Computer Journal, 8, October 1965.

Offprint of published paper.

2 related papers: 'Proposed Scheme for Segmenting CI's and SSR's' signed CS, February 1965; 'A Comparison of the Facilities of TRAC, SNOBOL, LISP, COMIT and the General Purpose Macrogenerator of C. Strachey', Cambridge Language Research Unit Document 4, August 1967, annotated by Strachey.

See C.197-C.201.

F.33 Draft Specification for 'Magtyper', 2 July 1966, 3 pp.

F.34 'How to make computers do difficult things easily'.

Summary only of paper given by Strachey at Machine Intelligence Workshop, 1966, held at Experimental Programming Unit (later, Department of Machine Intelligence), Edinburgh.

Folder contains abstracts of all papers given at the Workshop, which included R. J. Popplestone's POP-1, and related material on the Experimental Programming Unit.

F.35-F.39 'Systems Analysis and Programming', Scientific American, 215, September 1966.

Strachey described this as 'a popular article ... it describes, amongst other things, a draughts-playing program'. Strachey found difficulty in writing, and in adequately illustrating, the article, of which many drafts, revisions and alternatives survive in the folders both of working papers and editorial correspondence.

F.35 Editorial correspondence including invitation to write article (for special September issue of Scientific American on Information) and its content, miscellaneous additions and revisions, proposed German translation, 1966-69.

F.36 Extensive ms. working papers, plans, diagrams and drafts, including comments by colleagues.

F.37 Folder labelled 'Scientific American. Spare copies'.

Ms. drafts and revisions (not spare copies).

Publications, reviews, reports and papers

F.38 Extensively revised proofs and diagrams.

F.39 Copy of Scientific American, 215, with article as published.

Later correspondence re inclusion of article in Scientific American Reader on computers and computation, 1970.

Publications, reviews, reports and papers

F.40-F.54 'Fundamental Concepts in Programming Languages'.

This was a course of lectures given at the International Summer School in Computer Programming, Copenhagen, August 1967. Publication of the Proceedings was held up by editorial dilatoriness for so long that it was shelved, and Strachey continued to revise and rewrite his paper in the hope of having it published elsewhere as an extended journal article or a monograph. It remained unpublished, though some 250 copies were privately circulated.

Strachey described Fundamental Concepts as 'an important paper; it describes the basic principles underlying computing in a relatively unmathematical manner'.

In view of the importance Strachey attached to this unpublished paper, a full record of its composition and revisions has been retained.

See H.19-H.21

F.40 Lecture notes, circulated for Summer School on Computer Programming, Copenhagen, August 1967, duplicated typescript with ms. corrections and revisions, 17 pp.

The lectures were originally given from these notes, which were the basis for all subsequent written versions.

F.41-F.53 Autograph ms., corrected typescript and revisions of paper, as follows:

F.41 1.1, 1.2. Preliminaries, 2.1-2.6. Basic Concepts.

F.42 3.1-3.2. Conceptual Constructs.

F.43 3.3-3.4. Recursion. Commands and Sequencing.

F.44 3.5. Abstraction and Application.

F.45 3.6 (originally 3.5). Functions and Routines as Data Items.

F.46 3.7 (originally 3.6). Types and Polymorphism.

F.47 (originally 3.7). Compound Data Structures.

F.48 4. Miscellaneous Topics.

First typescript version, with ms. corrections.

Publications, reviews, reports and papers

F.49 November 1967 version of paper, with ms. comments and alterations by Halsbury, and errata list dated 1967.

Note: The table of contents shows some reallocation and renumbering of sections from that in the ms. version above, when the section on 'Recursion' was replaced.

F.50 'Author's Copy' of above, with some ms. corrections by Strachey and Halsbury, a letter (with 2 pp. list of 'notes') by Lord Halsbury to whom it had been sent for comment, December 1967 (see F.49 above).

F.51 'FCPL Working Papers', miscellaneous notes and drafts, including title pages, errata lists, etc. of various dates, 1967-70.

F.52 Pressboard binder, titled 'Fundamental Concepts in Programming Languages 1970', a photocopy of sections 1-3 only.

F.53 Another photocopy of above, with index dated October 1973, and extensive corrections and comments by R. Milne, J.E. Stoy and Strachey.

F.54 Correspondence with publishers re paper or monograph, mainly with editor of Computing Surveys (includes referees' favourable reports and comments), 1969-71.

Correspondence with Edinburgh University Press, Clarendon Press, Academic Press (1970), North-Holland Publishing Company (1971).

A duplicated copy of the paper appeared in Bulletin No.1 of I.F.I.P. Working Group 2.2, 20 February 1969 (see E.39).

Publications, reviews, reports and papers

F.55 'The Provision of Software'.

2 pp. note dated December 1967.

Duplicated typescript.

F.56 Report on the Multipop system, and POP-2 language, prepared for Department of Machine Intelligence and Perception, University of Edinburgh (formerly Experimental Programming Unit), 1968.

Ms. and typescript versions of report, with Strachey's notes on performance of system, and related material on reference manual, etc.

Brief correspondence with D. Michie.

See also F.34 above.

F.57-F.59 'Varieties of Programming Language'.

A paper read at the International Computing Symposium, Venice, April 1972 and published in the Proceedings.

See H.31

F.57 1 p. note on 'Varieties of Programming Language' dated August 1971, perhaps prepared for conference programme.

Errata and comments on paper, March 1972.

Ms. of text as circulated as Technical Monograph PRG-10, September 1972.

F.58 'Paper on Programming Languages'.

Ms. drafts and working notes for paper, including headings for talk or speech at meeting on GOL, n.d. and kept with above but perhaps intended for another occasion.

F.59 'Paper on Programming Languages'.

Folder of drafts, mainly on existing languages, 'Assignment Statements', 3 sections on 'Subroutines'.

(Material kept together in this folder by Strachey, though possibly used on different occasions.)

F.60 'OS6 - An experimental operating system for a small computer. Part I: General principles and structure' (with J.E. Stoy). The Computer Journal, 15, September 1972.

Offprint of published article.

Publications, reviews, reports and papers

F.61-F.75 'A theory of programming language semantics', 1973-75.

This work was submitted as a joint entry by Robert E. Milne and Strachey for the Adams Prize Essay of the University of Cambridge (closing date for entries 31 December 1974).

Strachey was Milne's Supervisor for his Thesis 'The formal semantics of computer languages and their implementations', submitted for a Doctorate of Philosophy at Cambridge (see F.61-F.64 below). After their subsequent collaboration for the Adams Prize, Strachey devoted much of the last months of his life to preparing the manuscript for publication, but died in May 1975 with the task incomplete. Milne rewrote and completed the work, which was published as 'A Theory of Programming Language Semantics' by Robert Milne and Christopher Strachey, Chapman and Hall, 1976.

F.61-F.64 Typescript copy of R.E. Milne's thesis.

F.61 Chapter I.

F.62 Chapter II.

F.63 Chapter III.

F.64 Appendix.

The three 'chapters' all include pages of ms. comments and notes by Strachey.

F.65 Ms. draft for the Adams Essay, including abstracts, contents list, etc. almost all in Strachey's hand, with some notes by Milne and others. Various dates, mainly October-December 1974.

F.66 Strachey's worksheets for Adams Essay, November 1974: an itemised breakdown of the work, specifying dates of composition, typing, checking, comments, etc. for each sub-section.

F.67 'Elementary Results', miscellaneous notes and calculations, various dates, November 1973, February, July, September 1974.

F.68 Ms. notes, and first ms. drafts, July-September 1974.

F.69 Ms. notes and drafts, Preface and sections 1.2-1.9, September-December 1974.

Publications, reviews, reports and papers

F.70 Ms. notes and drafts, sections 3.1-3.8, August-November 1974.

F.71 'Technical'.

Folder of miscellaneous notes and calculations, mainly testing out various hypotheses, November 1974-March 1975.

Includes copy of a note by R. Milne on 'Induction rule for loops' and two bundles of more extended notes (each 10 pp.) by Strachey, March 1975.

F.72 Miscellaneous ms. notes of plans for essay, queries and problems to be checked, notes of 'Possible changes, etc. for Book', list of 'Late Alterations', Strachey's 7 pp. list of comments. Various dates, March 1974-January 1975.

F.73 'SAL Standard Semantic Equations'.

Miscellaneous notes and examples for SAL 'a large and powerful paradigm programming language' introduced as Chapter 3 of Adams Essay.

F.74 Photocopy of Preface, Abstract and specimen pages of Essay, submitted to publisher.

F.75 Brief correspondence with University of Cambridge regarding Essay.

Includes errata list.

F.76 Circulation lists for Strachey's publications, 1961-63.

SECTION G LECTURES, TALKS AND PAPERS G.1 - G.42

The material is presented chronologically.

The substance varies from brief notes and headings for talks to substantial manuscript or typescript drafts, sometimes accompanied by research material, manufacturers' literature and correspondence.

The earlier lectures were undertaken while Strachey was employed by N.R.D.C. and often at its request; almost all of these refer to problems arising from projects in hand such as the Ferranti Pegasus, CPL, theory of programming, etc.

See Sections F and H for other lectures or papers by Strachey.

See General Introduction for a note on lectures given by Strachey at Oxford and retained at Programming Research Group.

Lectures, talks and papers

G.1 'Programming for the F.P.C.I.', a course of 10 lectures delivered by Strachey at Northampton Polytechnic, 13 January to 17 March 1955 (see also C.65-C.81 for working notes on Ferranti Pegasus).

Includes:

Printed programme and synopses of the lectures.

Ms. synopses of the lectures.

Ms. draft of 1st lecture 'Introduction to Programming for Computers', 7 pp.

Ms. notes for lectures 2 and 3.

Ms. notes for last lecture 'Mathematical Theory of some Subroutines', 10 pp.

Printed material for distribution to students - programming exercises, diagram of computing store, etc.

Folder also includes programme for series of lectures by J.H. Wilkinson on 'Programming for Pilot Ace and Deuce', and 'Short Bibliography on Automatic Digital Computing Machines'.

G.2 'Birmingham Lecture Notes'.

Strachey contributed lectures to courses on operational research, sponsored by the University of Birmingham Institute for Engineering Production, on several occasions in 1955 and 1957. He was invited to repeat his lecture on 'Electronic Digital Computers' in September 1957, but declined.

'Notes for a talk at Birmingham University Operational Research Course', 13-14 October 1955. Ms. notes (6 pp.), correspondence.

'Electronic Digital Computers', lecture for courses in April and May 1957. Ms. notes (6 pp. draft, 1 p. synopsis), printed notes for distribution.

Programmes for course on 'Operational Research', 13-14 May 1957 and on 'Electronic Computers in Industry', 15-19 April 1957. (Strachey is not listed as a speaker for this course.). Correspondence.

Lectures, talks and papers

G.3 'Notes for Various Lectures'.

Folder of miscellaneous sets of ms. notes; one is labelled 'Notes on Binary Floating Point'.

Includes correspondence with M.V. Wilkes and E.N. Mutch re Summer School on scientific applications of digital computers held in Cambridge in September 1957. Strachey's lectures were titled 'Review of Commercially Available Computers'.

Folder also includes brief correspondence re a British Council Course on Digital Computers, November 1957, at which Strachey lectured, and brief correspondence with manufacturers and firms re details of their machines, for use in the lectures.

G.4 Talk to Senior Officers' Training Course, Royal Army Pay Corps, Devizes, September 1958.

1 p. ms. notes for talk.

Correspondence with organiser re arrangements for talk which was originally scheduled for January 1958 but postponed because of Strachey's ill-health.

The subject was 'Problems attendant upon installing a computer' with special reference to the N.R.D.C./ Siemens project.

G.5 'Computer Techniques', 2 lectures for course on Electronic Computers and Business Problems, Dundee Technical College, 23-27 June 1958.

Includes:

Printed programme and information re the course, correspondence.

Stencilled lecture notes (3 pp.) for Strachey's lecture.

Carbon copies of lectures by S. Gill on programming, programming developments, information and coding, which were delivered at the same course.

G.6 'Some Commercially Available Computing Machines', lecture at Course on Applications of Computers, Faculty of Applied Science, University of Nottingham, 15-19 September 1958.

Includes:

Programme of the course, correspondence re Strachey's lecture.

Lecture notes prepared for distribution (typescript with ms. annotations and printed copy).

Ms. notes prepared by Strachey for his lecture.

Lectures, talks and papers

G.7 'Some Aspects of the Logical Design of Very Fast Computers', lecture to the Middlesbrough and District Branch of the British Computer Society, 7 January 1959.

Includes:

Printed notice of lecture.

Ms. notes and drafts for lecture (10 pp. and 6 pp.). Typescript draft (3 pp.).

Transcript of lecture and of ensuing discussion with ms. corrections, amendments and additions by Strachey (26 pp.).

G.8 'A method for finding the real eigenvalues of unsymmetric matrices'.

Talk given to Numerical Analysis Study Group of British Computer Society, 15 February 1962.

Brief correspondence with H. Goldenberg (organiser) re delivery of talk.

Includes programmes for finding real roots, and miscellaneous bundles of notes and loose papers on the subject.

Lectures 1962-63

G.9 'Notes on a Talk to a School', ms., 3 pp., 21 February 1962.

G.10 'Computers and the Intellectual Revolution', ms. 3 pp., 30 October 1962. Programme announcing lecture (to the Middlesbrough and District Branch of the British Computer Society) with reproduction of Strachey's article in The Observer Weekend Review, 18 February 1962 'A New Tool of the Intellect' (see F.22).

G.11 Lecture on the importance of computers, King Edward's School, Surrey, 10 October 1962.

Correspondence with science master re arrangements (no notes or text of lecture).

G.12 'How to Make Computers Do Complicated Things Simply', ms. 8 pp., 17 November 1962, for meeting of Oxford and District Branch of the Mathematical Association held at University of Reading. Correspondence and programme.

G.13 Lecture to Study Group of Institution of Electrical Engineers on Computer Design, 24 April 1963. 1 p. ms. notes for talk, correspondence re arrangements.

Lectures, talks and papers

G.14 'Digital Computers and Automation'.

Film made by Central Office of Information for release on television in the Commonwealth by British Information Services. Strachey introduced the programme, linked the sequences and provided the conclusion.

Correspondence, C.O.I. research document, script with Strachey's annotations, typescript of Strachey's contribution, short film strip.

G.15 'Mathematical Theory of Programming Languages'. Seminar given at M.I.T., autumn 1965.

Typescript synopses of seminar with ms. additions by Strachey, list of topics for term paper.

Ms. notes (1 p.) for introduction to the seminar. This is a very interesting exposition of Strachey's approach to teaching: 'Not a carefully prepared logical sequence of arguments leading irresistibly to a splendid conclusion. But a series of guerilla forays into a jungle of incomprehension in the course of which we shall retrace our steps, change our minds, run up against blank walls, but, I hope finally emerge with some inkling of the lay of the land and a smattering of the techniques of jungle warfare'.

Extensive ms. notes, calculations and diagrams prepared by Strachey for the seminar. These have been left in their original ordering and groupings.

In his letters to Leslie Fox (B.4), Strachey describes the seminars ('I was somewhat disconcerted to find that there are nearly thirty people who want to come') and comments on their value as a catalyst (' ... partly as a result of having to prepare for them and partly as a result of the actual discussions in the seminars, I have managed to clear up my ideas on a number of points and am now even more convinced than before that we have a new branch of mathematics to deal with').

See also correspondence and working papers re CPL (C.136-C.184) and re Strachey's later visits and work at M.I.T. (C.202-C.207).

Lectures, talks and papers

Lectures 1965-66

G.16 'Importance of computers', notes for talk at Southampton, July 1965, 7 pp. ms., 2 pp. typescript program. Probably for Schools Mathematical Project.

G.17 'The Relationship of Operating Systems and Programming Languages', talk at Mathematics Seminar, Harwell, 13 October 1966: abstract and correspondence, 6 pp. ms. draft of talk.

Lectures 1967

G.18 'Outline of CPL', lecture for A.F.I.R.O. in Paris, 20 March 1967, 6 pp. ms., typescript of abstract.

G.19 'Computing Research in U.K.', lecture in Grenoble, 21 March 1967, 3 pp. ms. (see H.19 for correspondence re this lecture).

G.20 'Names and Addresses', or 'What Happens when Variables Vary', Oxford Invariant Society, 14 November 1967. 7 pp. ms.

G.21 'First and Second Class Citizens in Programming Languages', Birkbeck College, London, 28 November 1967. 9 pp. ms., programme, correspondence re arrangements for talk.

G.21A 'Introduction to Non-Numerical Programming. Lecture notes for Course to Psychologists, 1967'.

Ms. notes for a collaborative course at Oxford with D. Park. Both Strachey's and Park's contributions are tagged together, presumably in the order in which they were given.

See General Introduction for a note on lectures given by Strachey at Oxford and retained at Programming Research Group.

Lectures, talks and papers

Lectures, c.1966-69

G.22 'Notes for Talks, etc. Mathematical Basis of Programming Languages', folder of miscellaneous ms. and typescript material of various dates, as kept by Strachey under the above heading.

'Fundamental Mathematical Concepts Underlying Programming Languages', 2 typescript drafts (2 pp. and 3 pp.) with numerous ms. amendments by Strachey, for introduction to a longer talk or paper on this subject.

Abstract of 'Towards a Formal Semantics', 2 pp. typescript (1966), 7 pp. ms. of same title.

'Basic Mathematical Concepts Underlying Programming Languages', lecture given at Pisa, December 1969. 8 pp. ms. notes.

'A problem with loops', 4 pp. ms.

'Appendix. Summary of notation used in this paper', 5 pp. ms.

Miscellaneous pages of ms. and typescript draft, notes, calculations.

Lectures 1968-69

G.23 'Computers for Engineers', Oxford, 15 March 1968. 6 pp. ms. See also B.23 re loan of films from Bell Telephone Laboratories, to illustrate this lecture.

G.24 'What Will Computing Systems Be Like in 1980?', Leicester Branch, British Computer Society, 21 March 1968. 5 pp. ms., correspondence re delivery, synopsis for distribution to members.

G.25 'Programming Languages', Oxford Branch, British Computer Society, 28 January 1969. 16 pp. ms. (not all in Strachey's hand), printed notice of lecture.

Lectures 1969

G.26 'Future of Programming Languages'. 5 pp. ms. of talk delivered at I.C.L. Bracknell, 20 February 1969, and I.C.L. Stevenage, 24 February 1969.

G.27 'How to Try without really computing', 3 pp. ms. of talk to the Oxford Invariant Society, 21 October 1969.

Continued

Lectures, talks and papers

G.27 (continued) Miscellaneous notes and 'Problems for Invariants' on 'The Game of Moo' for the Invariant Computer Group, founded Michaelmas Term 1968.

G.28 'BCPL usage and research', 1 p. typescript abstract of talk delivered at I.C.L. Advanced Programming Techniques Symposium, December 1969.

Lectures 1970

G.29 'Games, Playthings and Learning Programs for St. Edward's School', Oxford. 8 pp. ms., 22 January 1970.

G.30 'Computers and Civilization', or 'What Kenneth Clark Left Out?' 5 pp. ms., 30 January 1970.

G.31 'Computers', talk at Mathematics Today course for teachers of mathematics, Oxford, 5-18 April 1970. 2 sets of ms. notes, programme of the course.

G.32 'Current Literature Seminar. The work of Dana Scott. Outline of a Math. Th. of Computation', 8 pp. ms., 12 November 1970.

G.33 'An unusual operating system written in a high level language'. Seminar at Department of Machine Intelligence, Edinburgh, December 1971, given in the course of visit with S.C.R. Board of Visitors.

Notice of seminar and brief ms. notes only.

Lectures 1971-73

G.34 Typescript summaries of 3 talks: 'An Abstract Model for Storage' (Essex, 19 May 1971), 'The Logical Structure of a Single User Operating System' (Cambridge, 20 May 1971) and 'Experiments on the Design of Processors to work efficiently with Compilers', with correspondence.

G.35 'Games on Computers. Bristol Association of Young Scientists (?) - Oxford Schools', 3 pp. ms., 16 November 1971.

G.36 'Work in progress at the Oxford Programming Research Group', seminar at Cambridge, 25 April 1973. 8 pp. ms.

Lectures, talks and papers

G.37 Correspondence re seminar on semantics of programming languages, to be given at Department of Artificial Intelligence, Edinburgh, 19 February 1975, in the course of visit with S.R.C. Board of Visitors.

Includes programme of visit.

G.38 Folder of notes for lectures, undated.

'Use not construction of computers', 7 pp. ms.

Lecture on methods of programming, 8 pp. ms.

Typescript of contribution to discussion on programming languages, paginated 53-69; heavily annotated by Strachey.

7 pp. ms. notes, under 9 sub-headings, for talks on computers.

G.39-G.42 Correspondence re lectures and papers. Mainly invitations to lecture, contribute to seminars, etc. in UK and overseas.

In chronological order. 4 folders as follows:

G.39 1960-64.

G.40 1965-67.

G.41 1969-71.

G.42 1973-75.

SECTION H CONFERENCES AND VISITS 1956-75 H.1 - H.41

The material is presented chronologically.

It includes correspondence with organisers of conferences re invitations, travel arrangements, fees, etc., lists of speakers or participants, Strachey's oral or written contributions and the like.

Several folders contain ms. or printed versions of lectures or papers by Strachey which do not appear in Strachey's highly selective bibliographies of his own work in A.3, or in Section F. For ease of reference, such folders are listed below.

H.6
H.7
H.8
H.9
H.10
H.15
H.18
H.19 - H.21
H.22
H.35

Conferences and visits

H.1 Congresso della Società Italiana per il Progresso delle Scienze, Sicily, 15-21 September 1956.

Correspondence, travel arrangements, list of speakers at Mathematical session. 1956

H.2 'American Trip 1957'. 1957

Strachey made the trip in order to attend the Association for Computing Machinery Conference, 19-21 June 1957, Houston, Texas. While in USA he also visited the Lincoln Laboratories of M.I.T., the I.B.M. laboratory at Poughkeepsie, N.Y., the University of Illinois, the Remington Rand laboratory in Philadelphia and Bryn Mawr College. Strachey kept a notebook recording details of these visits (staff, equipment, programs, procedures, specifications and design of machines) as well as notes of addresses, travel arrangements, expenses incurred, during his journey. This journal is an interesting record of the state of computing in USA at that time.

The folder also includes a small amount of correspondence re scheduling of visits and material collected at the conference.

See C.33 for a similar notebook kept on Strachey's journey to Canada and USA in 1952.

H.3 Symposium on the Mechanization of Thought Processes, National Physical Laboratory, 24-27 November 1958. 1958-59

Includes:

Lists of delegates.

Copies of 3 papers presented at the symposium, including one by A.M. Andrew on 'Learning Machines'. Strachey commented on this paper, both at the Symposium and in the press.

Folder includes Strachey's 1 p. ms. notes on the paper, 2 ms. drafts of letters to the press and 3 pp. typescript of Strachey's contribution to the discussion following the paper.

Transcripts of Strachey's remarks in the various discussions at the Symposium, heavily amended and annotated, sent to him for corrections before publication.

Conferences and visits

H.4 Strachey's extensive ms. notes and calculations.

Printout of computation of single and double digit decimal sums, prepared as background material for his comments above on A.M. Andrew's paper.

H.5 Symposium on Matrix Computations, sponsored by Society for Industrial and Applied Mathematics, Gatlinburg, Tennessee, April 1961. 1960-64

Another symposium (with the same title) was held in Gatlinburg in April 1964. Strachey attended both symposia. On the 1961 visit he also spent some time at the Carnegie Corporation, M.I.T., and I.B.M.

Includes:

Correspondence re arrangements to attend Symposia and to visit American research laboratories and institutions.

Strachey's ms. notes on papers presented by others at the 1961 Symposium.

Lists of participants (1961 and 1964).

Programmes of lectures (1964).

Duplicated papers as distributed at 1964 Symposium.

Photographs (1964).

H.6 British Association for the Advancement of Science, Norwich, 30 August-6 September 1961. Strachey delivered a paper on 'Developments in mathematical and information processing languages', at a discussion on universal languages. 1961

Includes:

Typescript drafts of various portions of his talk. 5 pp. typescript summary for distribution at session.

Printed copy of B.V. Bowden's talk on 'The Impact of Automation'.

Press-cuttings re Strachey's paper.

Conferences and visits

H.7 Symposium on Symbolic Languages in Data Processing, sponsored by International Computation Centre, Rome, 26-31 March 1962. Strachey was one of the panellists at the discussion on 'Metasyntactic and Metasemantic Languages'. 1961-62

Includes:

Correspondence re arrangements for symposium and for travel.

Printed material (programme, memoranda, etc.) distributed at symposium.

The discussions were printed in the I.C.C. Bulletin, I, July 1962, of which a copy is included in the folder.

H.8 Conference on Automatic Programming Languages for Business and Science, sponsored by the British Computer Society and Northampton College of Advanced Technology, London, 17-18 April 1962. 1962

Includes:

Correspondence, programme, list of participants.

2 pp. Strachey's notes for his talk.

13 pp. transcript of Strachey's talk on 'Future Prospects' and transcripts of his several contributions to the discussion.

H.9 Programming Systems Symposium, London School of Economics, 2-6 July 1962. 1962

Includes:

Correspondence, programme, list of participants.

Abstract of Strachey's talk on 'Programming in Function Languages'.

Copy of paper by P. Wegner on 'Communication between independently translated blocks'.

H.10 Conference on Computer Education, Hatfield College of Technology, 30-31 May 1963. 1963

Includes:

Prospectus, programme, list of participants, correspondence.

2 pp. ms. note, transcript and revised typescript of Strachey's contribution 'What are the demands made by computer science on the educational systems'. This is a very interesting exposition by Strachey on the potential uses of computers, the importance of software vs. hardware, and the intellectual revolution brought about by the advent of computers.

Continued

Conferences and visits

H.10 (continued)

Folder contains copies of papers presented by others (H.G. Ap Simon, D.W. Hooper, E.C. Clear Hill, W.G. Bickley, J. Crank, B.S. Walker, S. Gill, F.S. Ellis, M.M. Barritt).

See E.13, F.29, F.30 for further material relating to computers in education.

H.11, H.12

Summer School on 'Advances in programming and non-numerical analysis', Oxford, 26 August-6 September 1963. 1961-65

The Summer School was sponsored by the Oxford University Computing Laboratory in association with the Delegacy for Extra-Mural Studies and was organised by Strachey, L. Fox and S. Gill. The lectures given at the Summer School were published by Pergamon Press in 1966. Strachey and D. Barron gave 8 lectures on 'Programming'; see the note in A.1, written by Barron after Strachey's death and published in Computer Bulletin, which describes the Summer School and the writing up of the lectures.

2 folders as follows:

H.11

Correspondence between Strachey, Gill and Fox, re organisation and programme of the School (preliminary work began in 1961). Copies of letters from Fox to lecturers.

Draft pamphlet with comments by Gill.

List of participants. Programme.

Correspondence re publication.

H.12

One folder of technical papers, drafts and notes for lectures on programming, 3 pp. draft on 'Other Problems', 1 p. on 'Machine Design', 1 p. on 'Artificial Intelligence'. Notes on 'Automatic Abstracting'.

See also E.7.

H.13

Visit to Centro Studi Calcolatrici Elettroniche, Pisa, to deliver lectures on the mathematical concepts underlying programming languages, and to CERN to talk about time-sharing, December 1964. 1964

Correspondence, travel documents and notes of expenses.

Conferences and visits

H.14	Seminar on the Teaching of Computational Science, Liverpool University, 31 March-1 April 1965. Correspondence, programme, information for participants.	1964-65
H.15	School Mathematics Project, conference at Southampton, July 1965. Includes: Programme, list of participants, correspondence re arrangements for Strachey's lecture. Synopsis of Strachey's contribution, 'Computer Programming'. 2 sets of ms. notes 'Solutions to examples' for class following the lecture. Copies of synopses and example sheets for other lectures in the conference.	1965
H.16, H.17	Programming Languages and Pragmatics, A.C.M. Working Conference, San Dimas, California, 8-12 August 1965. Strachey chaired the session on 'Descriptive or Declarative Languages'.	1965
H.16	Preliminary notices and planning papers. Programme and list of participants. Correspondence re organisation of sessions and subsequent publication in Communications of the ACM. Strachey's notes on descriptive languages, list of 'Words which are not well understood' (see C.180), 'How is translating like other data processing?'.	
H.17	Copies of other papers presented at the conference.	
H.18	Seminar on Time Sharing, University of Bergen, 6-8 February 1967. Strachey's talk was called 'The Economics of Time Sharing in a Not Perfectly Affluent Society'. Correspondence, programme, list of participants. Ms. draft of talk; several sets of notes (11 pp. total).	1966-67

Conferences and visits

H.19-H.21 International Summer School on Computer Programming, sponsored by NATO Science Committee, organised under the auspices of the Technical University of Denmark, 7-25 August 1967. 1966-68

Strachey delivered a course of lectures called 'Fundamental Concepts in Programming Languages'. He wrote the lectures up for publication, but the official conference proceedings were not published. Several hundred copies of Strachey's paper were circulated privately. In his annotated bibliography (A.3) Strachey called it 'an important paper; it describes the basic principles underlining computing in a relatively un-mathematical manner'.

See F.40-F.54.

H.19 Correspondence re arrangements for Strachey's lectures, and organisation of summer school. Preliminary notices, list of participants, programme, correspondence re publication.

H.20 2 pp. typescript abstract and 1 p. outline of Strachey's lectures.

Includes:

Ms. draft of lectures (34 pp.).

Typescript, annotated (24 pp.)

'Some remarks on C. Strachey's lectures', typescript of talk by R.M. Burstall, who conducted the closing discussion after Strachey's lectures.

H.21 Printed material distributed at conference. Includes stencilled copy of notes distributed by M. Nivat prior to his address at one of the closing sessions.

Conferences and visits

H.22 Symposium on Computer Science, Girton College Cambridge, 8-12 August 1969. Strachey gave a talk 'Is Computing Science?' which was later published in the Bulletin of the Institute of Mathematics and its Applications, 1970. 1968-72

Includes:

Correspondence re organisation of Symposium and publication of its proceedings.

Several versions of Strachey's talk:

ms. notes (6 pp.)

typed transcript (11 pp.)

ms. notes for revision for publication (1 p.)

annotated typescript (8 pp. + 1 p. ms. table)

final typescript (10 pp.)

photocopy of published version (1970) with later revisions (October 1972) to table of subjects for inclusion in computing courses graded according to relevance and to state of development.

H.23 NATO Conference on Techniques in Software Engineering, Rome, 27-31 October 1969. 1969-70

Includes:

Formal notification of conference, list of participants, correspondence re publication of conference proceedings.

Papers re proposed establishment of International Institute for Software Engineering.

H.24 Visit to Germany, 7-16 December 1969, sponsored by the British Council. Strachey visited the Institut für Mathematik und Datenverarbeitung in Bonn and the Technical University in Munich but had to cancel his lectures in Erlangen due to illness. 1968-70

Includes:

Correspondence re arrangements for trip (lecture schedule, topics, travel documents).

Itinerary and programme as organised by the British Council.

Strachey's report (2 pp.) on his visit.

'Fundamental concepts of Prog. Lang.': 1 p. of notes for 'one lecture', 2 pp. of notes for 'three lectures'.

'Logical Structure of a small Experimental Operating System', 2 pp. notes.

Conferences and visits

H.25 — Symposium on The State of the Art, sponsored by Infotech, March and May 1970. Strachey spoke on 'The Influence of Software on Machine Design' in the 'Fourth Generation' series of lectures in May. — 1969-70, 1972

Includes:

Correspondence, programme, list of speakers.

Printed abstracts of talks by participants, including synopsis of Strachey's contribution.

See also H.28.

H.26, H.27 — 'Computing and Data Processing', CERN Summer School, Varenna, 30 August-12 September 1970. Strachey served on the Advisory Committee which organised the Summer School. — 1969-70

H.26 — Includes:

Correspondence re meetings of the Advisory Committee, copies of invitations to prospective speakers, sent to Strachey for information.

Minutes of the meetings of the Advisory Committee, committee papers, timetables.

Bulletins 1 and 3.

Strachey's ms. notes taken at meetings.

H.27 — Copies of abstracts of lecture courses at the School.

H.28 — Symposium on the State of the Art, sponsored by Infotech, February 1971. Strachey spoke on 'Varieties of programming language: Language comparison techniques', in the 'High Level Languages' series of lectures. — 1970-71

See H.25 for a previous Infotech Symposium.

Includes:

Correspondence, programme, list of speakers.

Printed summaries of talks by various participants, including synopsis of Strachey's contribution.

Correspondence re publication.

Folder also includes later request (1972) for Strachey to contribute a paper on systems measurement to the report based on State of Art lectures, June 1972.

Conferences and visits

H.29 — Visit to Denmark to lecture in Aarhus and Copenhagen, September 1971. — 1971

Correspondence re arrangements for Strachey's visit.

H.30 — 'The Teaching of Computer Design', fourth in a series of International Seminars in Computing Science sponsored by I.B.M. and the University of Newcastle, held in Newcastle, 7-10 September 1971. Strachey had intended to participate but a change in scheduling of his lectures in Denmark (see H.29) made it impossible for him to attend. — 1969-74

Correspondence re travel and conference arrangements, programme, lists of participants and speakers.

Folder also includes invitations to attend the 1969-70, 1972-74 Seminars. (Strachey did not attend any of them.)

H.31 — International Computing Symposium, organised by the European Chapters of the A.C.M. in cooperation with the Associazione Italiana Calcolo Automatico, Venice, 12-14 April 1972. Strachey presented a paper 'Varieties of Programming Languages'. — 1971-72

See F.57-F.59

Correspondence, programme, list of participants.

1 p. abstract and 12 pp. (+ 1 p. errata list) typescript of Strachey's talk.

Folder also includes correspondence with Paolo Ercoli re arrangements for 2 seminars Strachey gave in Rome, 6 and 7 April 1972, on 'Outline of a Mathematical Approach to Programming Language Semantics'. 14 pp. ms. notes for these seminars (see also H.32).

H.32 — Conference on Undergraduate Curriculum in Computer Science, University of Waterloo, 2-3 October 1972. Strachey gave a position paper on 'The Academic Viewpoint'. — 1972

Includes:

2 pp. typescript synopsis of Strachey's presentation.
27 pp. partial transcript of talk.

Correspondence, list of participants, copy of the proceedings with report of Strachey's talk.

Continued

Conferences and visits

H.32 (continued)

Folder also includes summaries of 4 talks which Strachey offered to give to the University of Waterloo Computer Science Department.

Ms. notes (9 pp.) for 2 seminars on 'Outline of a Mathematical Approach to Programming Language Semantics' (see also seminars delivered in Rome, August 1972 - H.31)

See C.249

H.33

Workshop on String Processing Techniques, sponsored by the Office of Scientific and Technical Information, 20-21 November 1972, Watford. 1972

Programme, list of participants, abstracts and printed copies of some of the lectures given. (Strachey was not one of the speakers.)

H.34

Logic Colloquium, University of Bristol, 16-20 July 1973. Strachey presented a paper on 'Some Unsolved Problems in the Theory of Computation'. 1972-73

Includes:

Correspondence, preliminary notices, programme, list of participants.

Typed abstract and 2 pp. ms. notes for Strachey's contribution, July 1973.

H.35

Software '73 Conference, Loughborough University of Technology, 9-11 July 1973. Strachey spoke on 'How can we put programming theory into practice?'. 1973-74

Includes:

Correspondence, list of delegates, transcript of questions and answers at the discussion following Strachey's lecture.

2 pp. ms. notes and 20 pp. typescript (+ 1 p. abstract and 1 p. bibliography) of Strachey's contribution.

This talk was used as a basis for a presentation at the I.B.M. Scientific Center, Peterlee, on 14 August 1973. The folder includes correspondence and travel documents re this presentation. Strachey was also invited to repeat the lecture at the Computing Laboratory, University of Kent, 1973 and 1974, but declined.

Conferences and visits

H.36	Mathematical Foundations of Computer Science Semester, Stefan Banach International Mathematical Center, Warsaw, January-June 1974. Strachey planned to attend during April but had to cancel his visit owing to pressure of work in Oxford. Correspondence, programme.	1973-74
H.37	Presentation by Strachey to the Real Time Software Techniques Study Group, set up by Computers, Systems and Electronics Requirements Board of the Department of Industry in 1974 'to study the background to programming methodology, for future real-time computing systems'. Strachey spoke on 'Problems of specifying languages and their influence on machine design', 20 January 1975. Strachey's 3 pp. ms. draft, typescript extracts from minutes of meeting of 20 January summarising Strachey's presentation and comments, correspondence.	1975
H.38-H.41	Shorter correspondence re conferences, symposia, overseas visits, etc. 4 folders presented in date order:	
H.38	1966-68.	
H.39	1969-70.	
H.40	1971-72.	
H.41	1973-75.	

SECTION J CORRESPONDENCE J.1 - J.72

The material is presented as follows:

J.1 -J.46	Correspondence with individuals and organisations
J.47-J.53	Shorter correspondence with publishers and editors
J.54-J.67	References and reports
J.68-J.72	Miscellaneous shorter correspondence (not indexed)

The correspondence is presented alphabetically, with dates and a note of any material of particular personal or technical interest.

Extensive correspondence with an individual is lodged in a personal folder or folders; shorter exchanges are grouped together in a miscellaneous folder.

Shorter correspondence relating to projects undertaken when Strachey was on the staff of National Research Development Council appears under N in J.27, J.28 and is itemised. See also correspondence with Lord Halsbury, J.12 - J.19.

Not all the letters survive, and a note has been made in the entries for cases when only Strachey's carbon remains.

For shorter correspondence re invitations to give lectures or papers, see G.39 - G.42.

For shorter correspondence re conferences and visits, see H.38 - H.41.

Correspondence

J.1-J.46 Correspondence with individuals and organisations.

J.1	Alway, G.	(macrogenerator, CPL)	1965
	Ashby, W.R.	(memory score)	1957
	Auerbach, I.L.		1962
J.2	Bastian, A.L.	(Contract Bridge Bidding Language, LISP)	1962
	Bauer, F.L.		1961
	Birmingham and Midland Institute	(machine-produced poetry)	1968
	Belnap, N.D.		1970
J.3	Bowden, B.V.	(Computer Sub-Committee) (Strachey's carbon only)	1961
	Bray, J.W.	(Labour Science & Technology Group)	1965
	Brooker, R.A.		1960
	Buckingham, R.A.	(Institute of Computer Science, London)	1973
J.4	Burstall, R.M.		1963-64
	Clauser, F.H.	(offer (declined) for Strachey to lead computing program at University of California, Santa Cruz)	1966
	Clegg, D.	(hierarchical methods in programming)	1969
J.5	Colin, A.J.T.		1966
J.6	Churchhouse, R.F.	(first mention of 'multi-access')	1973
	Cornford, C.		1968
	Cowling, T.G.	(Chair of Computing, Leeds University)	1964
	Davy, J.	(chess-playing program)	1962
	De Lotto, I.	(macrogenerator)	1966
	Dijkstra, E.W.	(photocopy of letter to J.E. Stoy retained by Strachey with his own papers)	1973

Correspondence

J.7	Duncan, C.J.	(Monotype control tape)	1962
	Eperson, D.A.	(film strip on calculating machines)	1958
	Ershov, A.	(CPL)	1966
J.8	Evans, A.		1968, 1971
J.9	Flexner, W.W.		1960, 1963, 1971
J.10	Fraser, A.G.		1969, 1971
J.11	Frost, P.H.		1963, 1966
	Givens, W.		1972

J.12-J.19 Halsbury, J.A.H.G.

Correspondence and memoranda exchanged re N.R.D.C., its projects and policy 1953-55 as follows:

J.12	7 pp. memorandum by Strachey on 'Future Work' re his own projects especially for 401 and Autocode,	May 1953
J.13	3 pp. note by Strachey on 'Digital computing and information handling', prepared for and sent to P.M.S. Blackett,	Sept. 1953
J.14	'N.R.D.C. Policy on computers', note prepared by Halsbury and submitted for comment to Strachey and D. Hennessey, with Strachey's annotations, copies of his comments and those of Hennessey, letter from Halsbury,	Sept.-Oct. 1953
J.15	5 pp. memorandum from Halsbury on machine logic, heavily annotated by Strachey,	Sept. 1953
J.16	Comments by Halsbury on Strachey's paper on 401 Code,	Oct. 1953
J.17	Memoranda by Strachey on his dealings with Ferranti and Manchester University over Mark II computer, 2 versions,	7 and 11 Jan. 1955

Personal and professional correspondence on research projects, publications, general developments in computer science, etc.

J.18	1960-65	(Halsbury's letter of 22 April 1965 draws an interesting comparison of 'Tristram Shandy' with a computer 'supervisor program')
J.19	1968, 1970	(includes note by Halsbury on Desargues' Theorem), 1971, 1974 (includes note by Halsbury on possible sequence control of cell cycles)

Correspondence

J.20	Higman, B.	(macrogenerator)	1964-65
J.21	Home Office	(classification of fingerprints)	1964
	Institute of Contemporary Arts	(Computer Art)	1966
	International Business Machines		1965-75
J.22	Joseph, Sir Keith		1959
	Knuth, D.E. (includes copy of letter on Strachey's terminology 1968)	(history of 'time-sharing')	1974
	Landin, P.J.	(Strachey's carbons only)	1965
	Laski, J.G.	(mathematical semantics and Adams Prize work)	1974
	Levinstone, A.	(CPL)	1966-67
J.23	Lighthill, Sir (Michael) James	(re Lighthill's enquiry into current research into Artificial Intelligence)	1972
	Includes also brief correspondence with producer of BBC TV 'Controversy' programme on the Lighthill report, at Royal Institution, July 1973, which Strachey attended, re a correction to be made following advice from J. McCarthy.		
J.24	Lindop, N.		1967
	Maddison, R.N.	(macrogenerator)	1967
	Madge, J.	(computers for hospitals)	1963
J.25	Michie, D.	(general scientific correspondence, including references to A is B Committee, Machine Intelligence Workshops at Edinburgh, etc.)	1962-73
J.26	Milner, R.		n.d., 1971, 1973

Correspondence

J.27, J.28	National Research Development Corporation.		
	Correspondence exchanged with individuals or re various projects undertaken by Strachey during his service with N.R.D.C.; in alphabetical order.		
J.27	Blackett, P.M.S.	(Stretch)	1959
	British Transport Commission	(check digits)	1959
	Brooker, R.A.	(matrices)	1958
	Elliott Bros.	(Bull Printer code)	1956
	E.M.I.		1957
	Ferranti		1957-58
	Greig, W.A.		1959
	I.C.I.		1957
J.28	Remington Rand		1958
	Rose	(Fast adder & multiplier)	1958, 1959
	Siemens project		1958
	Silver City Airways		1958
	Miscellaneous internal memoranda.		
J.29	National Science Foundation (including Strachey's own description of his work in progress 1960, 1961 for Current Research & Development in Scientific Documentation)		1960-61
	Needham, R.		1966
	Nygaard, K.		1967
J.30	Playfair, Sir Edward (includes draft of speech to be given by Playfair at Computer Conference in USA, with Strachey's annotations and comments)		1961-64
J.31	Rees, D.H.	(closing down of Elliott NRDC 401)	1965
	Rego, F.A.		1972
	Riding, G.		1973

Correspondence

J.32, J.33 Richards, M. 1965-67, 1974

The correspondence, which is amost entirely technical, deals with CPL (and manual), BCPL, KDF9 and general matters relating to the setting up of Strachey's Programming Research Group at Oxford. During the period of the correspondence, either Strachey or Richards was at Project MAC, Massachusetts Institute of Technology, hence the long and detailed accounts of technical projects and problems.

Strachey hoped that Richards might accept a post with the Programming Research Group, Oxford, but he remained to complete his thesis and work on BCPL in America.

J.32 December 1965-March 1966 (includes Strachey's offer to Richards of a post and his outline of projects for the Programming Research Group, and letters by Richards on CPL work at Cambridge, England)

J.33 December 1966-December 1967 (on CPL, BCPL, KDF9, written while Strachey was in Oxford and Richards in Cambridge, Massachusetts) and one letter 1974.

J.34	Samuel, A.L.	(Strachey's own projects, and current state of computer activities in UK)	1957
	Saville, N.R.	(macrogenerator)	1967
	Schwarz, H.R.	(ALGOL as standard language)	1961

J.35-J.41 Scott, Dana S. 1969-75

Scott and Strachey collaborated closely from 1969 until Strachey's death. In December 1971, Strachey wrote: 'In September 1969 Dana Scott came to Oxford and as a result of discussion about the formal semantics produced his theory of continuous lattices and was able to give for the first time a set theoretic model of λ- calculus. To my mind this work has changed the whole basis of the theory of computing and promises to provide the sound mathematical foundation which has so far been lacking. There is a great deal of work still to be done in applying this to the problems of actual programming languages and developing general theorems and techniques for providing properties of programs. This work and the practical work on systems continue to form my main preoccupation.'

Continued

Correspondence

J.35-J.41 (continued)

The collaborative work was often carried on by correspondence when Strachey or Scott were abroad, and these frequent and lengthy exchanges enable the growth of ideas to be charted. Though other matters are discussed, such as travel and conference plans, publication and circulation arrangements, appointments, etc., the bulk of the correspondence remains primarily technical in content.

Papers discussed, often by their initials, are 'Outline of a Mathematical Theory of Computation' (OMTC), 'Lattice of Flow Diagrams' (LFD), 'Towards a Mathematical Semantics for Computer Languages' (TMSCL). Copies of letters from colleagues, publishers, etc. are sometimes included. The 1970 correspondence was kept by Strachey in 2 looseleaf ring binders, with an (incomplete) index by him (J.36, J.37).

J.35 April-September 1969.

Arrangements for Scott's stay in Oxford, travel and conference itinerary, correspondence on 'push-down stores' (PDS), axioms, etc. (some letters are annotated by Strachey), and including some correspondence with C.A.T. Hoare.

J.36 Looseleaf ring binder of correspondence, while Scott was in Princeton, April-July 1970.

Mss. and working notes are also included.

Includes ms. index by Strachey. Letters are numbered in sequence as follows: DS I, CS I (with ms. and notes), DS II, CS II, DS III, DS IV (including plans for series of P.R.G. Technical Monographs), CS III, DS V, DS VI (including correspondence with D. Michie, N. Belnap), CS IV (including ms. by C. Wadsworth), CS V (including ms. of Scott's OMTC papers), CS VI, CS VII, DS unnumbered (reply to C. Wadsworth), DS unnumbered (including correspondence with A. Evans, D. Michie), DS IX.

Correspondence

J.37	Looseleaf ring binder of correspondence, August 1970-May 1971. Letters numbered as follows: DS I (New Series) (including correspondence with N. Belnap, C. Böhm), DS II (including correspondence with E. Engeler, C. Wadsworth, and Scott's ms.), CS I (New Series) (including Strachey's ms. on Jumps), CS II, CS III, DS IV (including correspondence with L. Smullin), CS IV, CS V, DS V, DS III, DS VI, CS VI, DS VII, CS VII, CS VIII (including circulation lists for papers), DS VIII, CS IX, CS X, DS unnumbered (including correspondence with J. Fox)		
J.38	Correspondence 1970-71, not included by Strachey in looseleaf binders, but covering same period and material; includes suggestions from colleagues, correspondence with editors, annotated draft of paper "Towards a Mathematical Semantics for Computer Languages'.		
J.39	Correspondence with J. Reynolds		1971
J.40	Correspondence with D. Michie and D. Park		1970
J.41	Miscellaneous correspondence with Scott, various dates		1970-75
J.42	Sessions, R.E.		1974
	Tørning, D.	(macrogenerator)	1967
	Tocher, K.D.	(plant simulation programme)	1959
	Trask, M.	(history of computing)	1974
	Ullman, J.D.	(loop theorem)	1971
	Van Horn, E.C.	(CPL)	1966
J.43	Wadsworth, C. Includes earlier correspondence (1970) with H.B. Curry re work in which Wadsworth was interested, on Böhm's Theorem.		1974-75
J.44	Walden, D.C.	(macrogenerator)	1967-68
	Wallace, V.L.		1966
	Weizenbaum, J.	(KLS and LISP systems)	1962
J.45	Wilkes, M.V.	(brief correspondence on LISP and ALGOL)	1960
		(draft mss. by Wilkes annotated by Strachey)	1970
	Woodger, M.	(ALGOL, macrogenerator)	1964-65
J.46	Wynn, P.	(early ALGOL) postcard	1957
	Young, D.A.		1965

Correspondence

J.47-J.53 Shorter correspondence with publishers and editors.

Requests to Strachey to write or advise on books or articles, report on mss. submitted for publication, etc., including various possibilities for the publication of the work on programming language semantics submitted for the Adams Prize (see also F.61-F.75).

The correspondence is presented alphabetically, with dates, and a note of any material of particular interest.

7 folders as follows:

J.47	Academic Press	(on λ-calculus, lattice theory and programming language semantics)	1970, 1973-74
	Cambridge University Press	(Computers for schools)	1964
	Chapman & Hall		1974
J.48	Collins Publishers	(entries for Dictionary of Modern Thought)	1974-75
	Computer Weekly		1971
	Encounter		1966
	Encyclopedia Britannica	(invitation (declined) to contribute article on 'Computers')	1970
J.49	G.T. Foulis & Co.		1966
	History & the 20th Century		1969
	L'Informatique		1972
	Institute of Mathematics and its Applications	(Journal)	1967
		(Bulletin)	1970
	Macdonald & Co.		1964, 1970
	Macmillan		1974
J.50	A. J. Moakes	(computers for schools)	1962
	New Scientist		1961, 1965
	Oliver & Boyd		1960
	Penguin Books		1968, 1971

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J.51	Pergamon Press Ltd.	1964
	Prentice-Hall Inc. (re Programming Language semantics)	1974
	Software (Wiley interscience)	1971
	Springer-Verlag	1973-74
	Transcripta Books	1975
J.52	The Times Publishing Co. Ltd.	1962-74

Includes:

Letter to the Editor on STD 1962 (not published) (and a letter to Marghanita Laski on same subject)

Ms. letter from Assistant Editor requesting article on computer and the arts, 1964

Letter to the Editor on 'A Computed Name', published 25 January 1972

Letter on spelling of 'program' to correct misspelling of the word in above letter, January 1972

Letter to the Editor on production costs of fuel, January 1974

J.53	Miscellaneous reports on books or articles submitted to Strachey by publishers and editors for comment	1967-72

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J.54-J.67 References and reports.

J.54-J.59 Academic appointments.
6 folders in alphabetical order.

J.54 B

J.55 G - L

J.56 L

J.57 M

J.58 M - P

J.59 R - W

J.60-J.63 Research projects, reports and prizes.
4 folders in chronological order.

J.60 1965

J.61 1968-70

J.62 1969-72

J.63 1973

J.64-J.66 Examinations and theses.
3 folders in chronological order.

J.64 1961

J.65 1970

J.66 1973-74

J.67 Personal.

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J.68-J.72	Miscellaneous shorter correspondence (not indexed).	
J.68	Shorter scientific correspondence.	
	Requests for information, exchange of reprints, permission to quote material, sent or received by Strachey. (Many refer to Macrogenerator, Time-sharing and 'Fundamental Concepts' papers.)	1959-73
J.69	Strachey's requests for reprints or information from colleagues.	
J.70	Brief correspondence re requests for information, references, permission to quote from Strachey's publications.	
J.71	Brief correspondence to accompany publications sent to Strachey.	
J.72	Miscellaneous shorter correspondence.	

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