THE ROYAL COMMISSION ON HISTORICAL MANUSCRIPTS

Report on the correspondence and papers of

CHRISTOPHER ALWYNE JACK YOUNG, FRS

pioneer of instrumentation

and process control systems

1930-1978

Deposited in the Science Museum Library,

London

Reproduced for the Contemporary Scientific

Archives Centre

(CSAC 78/8/79)

by

THE ROYAL COMMISSION ON HISTORICAL MANUSCRIPTS
Quality House, Quality Court, Chancery Lane,
London WC2A 1HP

1979

CSAC 70/B/79

CONTEMPORARY SCIENTIFIC ARCHIVES CENTRE

under the guidance of the Royal Society's
British National Committee for the History of Science, Medicine and Technology

Catalogue of the papers of

CHRISTOPHER ALWYNE JACK YOUNG, FRS

(1912 - 1978)

Compiled by: Jeannine Alton
Julia Latham-Jackson

Deposited in the Library of the Science Museum,
South Kensington, London, 1979

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

THE LIBRARIAN,
SCIENCE MUSEUM LIBRARY,
SOUTH KENSINGTON,
LONDON

LIST OF CONTENTS

		Items	Page
GENERAL INTRODUCTION			3
SUMMARY OF CAREER			6
SECTION A	Biographical and personal	A.1 - A.42	7
SECTION B	Central Instrument Research Laboratory, Imperial Chemical Industries Ltd. (I.C.I.)	B.1 - B.210	13
SECTION C	Lectures, papers, publications, conferences	C.1 - C.29	41
SECTION D	Correspondence	D.1 - D.27	46
INDEX OF CORRESPONDENTS			49

GENERAL INTRODUCTION

The majority of papers in the collection (see Section B) relate to the I.C.I. Central Instrument Section (later the Central Instrument Research Laboratory) of which Young was Director from its establishment in 1946 until 1971, and Technical Director, 1971-73. They consist of memoranda, correspondence, research reports, committee papers, etc. documenting various aspects of the history and development of the Laboratory during this period; in addition there is a set of I.C.I. Instrument Information Bulletin, 1956-62 (see B.177-B.210 and introductory note). The remaining Sections contain personal and biographical papers, lectures and other writings, and some correspondence.

C.A.J. Young joined I.C.I. in 1940 and worked on various engineering projects during the war, including FIDO (for dispersing fog from airfields) and the Tube Alloys (Atomic Bomb) Project. Some reminiscences about this period are to be found in C.13, C.14. In 1946 the I.C.I. Technical Director, F.E. Smith (later Sir Ewart Smith) invited Young to set up a central instrument laboratory. Young later wrote of this invitation 'I was very fortunate in 1946. In two respects. First, my experience had shown me the importance to industry of exploiting the full potential of instrumentation and automatic control, and I believed I knew how this could be achieved. Secondly, Sir Ewart Smith had also appreciated the need for long-term research and development and invited me to be responsible for fulfilling it for I.C.I.' (see A.2)

The laboratory was originally set up as 'A general instrument research and development section ... to act as a service to all Divisions ... keep in touch with instrument practice at home and abroad, and hold certain specialised equipment for general use in I.C.I.' (see B.3). In the early 1950s, however, Young decided to concentrate the work of the laboratory on the design of process control systems. His objective was that process, plant and control equipment should be designed as one unified system to eradicate the practice of adding the control equipment as an afterthought to a plant already designed. In order to achieve this he directed the laboratory towards the target of predicting the dynamic behaviour of chemical processes at the design stage, and introduced the concept of the 'mathematical model' to describe any system under consideration.

By 1956 electronic computers capable of solving the complex equations generated by this line of research were a practical reality, and Young was quick to see their advantage. He persuaded I.C.I. to purchase a Ferranti Mercury in 1958, and his subsequent efforts to ensure that the Company took advantage of the most recent developments in the computing industry are well documented in the collection (see B.78 - B.115). He also encouraged research into a new high level language specially designed for on-line computer applications, and a novel system of interface instrumentation, both of which were designed to reduce costs and thus improve the practical possibilities of implementing a complete on-line system (see B.95 - B.102).

Recognition of Young's achievements in the field of process control came in 1969 with the award of the honorary degree of Doctor of Technology by Bradford University (see A.18) and the presentation of the first Sir Harold Hartley Medal by the Institute of Measurement and Control (formerly the Society of Instrumental Technology, of which Young was President, 1954 - 57). Fellowship of the Royal Society followed in 1972.

At the end of 1966 Young had to undergo a severe operation from which he never fully recovered. He continued to involve himself in the work of the laboratory when he was able, but in 1971 his health forced him to relinquish the Directorship and he accepted the advisory post of Technical Director to the I.C.I. Corporate Laboratory which was formed by merging the Central Instrument Research Laboratory at Bozedown with the I.C.I. Petrochemical and Polymer Laboratory at Runcorn in 1972. He retired from I.C.I. in 1973.

A word should be said here about Young's Christian names. He was born Alwyne Jack, and many of his friends and colleagues called him 'A.J.', but his wife knew him as Christopher, the name by which he had first introduced himself to her, and in 1969 he changed his name by deed poll to Christopher Alwyne Jack Young.

The papers were received from Mrs. Young through the agency of Mr. S.T. Lunt, who provided valuable help and advice in the initial sorting of the papers. We are also grateful to Dr. A. Spinks, F.R.S. who kindly allowed us to see and to quote from a proof copy of the Memoir of C.A.J. Young by R.L. Day and A. Spinks to be published in Biographical Memoirs of Fellows of the Royal Society, 25, 1979.

SUMMARY OF CAREER

b.1912	Calne, Wiltshire
educ.	Colston's School, Bristol
1930 - 34	St. Edmund Hall, Oxford (B.A., B.Sc.)
1934	Science master, Radley College (Easter Term only)
1934 - 38	Science master, Cheltenham College
1938 - 40	Assistant Meteorologist, Sudan Government Service
1940 - 46	I.C.I. Ltd., Billingham Division
1946	Married Wendy Henniker-Heaton
1946 - 71	Director, I.C.I. Central Instrument Section (later Central Instrument Research Laboratory)
1954 - 57	President, Society of Instrument Technology
1969	Hon. D. Tech., University of Bradford
	First Sir Harold Hartley Medal
1971 - 73	Technical Director, I.C.I. Corporate Laboratory
1972	Fellow of the Royal Society

SECTION A — BIOGRAPHICAL AND PERSONAL (A.1 - A.42)

A.1 — Obituaries of Young, including one from The Times, 14 March 1978.

A.2 — 'A.J. Young. Personal Details and Account of his work'.

Typescript prepared by Young in August 1969 for his proposed election to the Fellowship of the Royal Society (see A.20, A.25, A.26).

A.3 — Miscellaneous autobiographical notes, including various drafts for the above.

A.4 — Photocopies of articles about Young from Control Engineering, 1957, and The Daily Telegraph, 1972.

A.5 — Papers relating to Colston's School, Bristol.

Testimonials by the Headmaster, 1930, 1933. (Young was a pupil at the school 1926-30.)

A.6-A.8 — Oxford University.

A.6 — Correspondence and testimonials from:

A.B. Emden (Principal, St. Edmund Hall) 1931, 1933, 1938

C.H. Thompson, 1931

T.C. Keeley, 1933

J.S. Brewis, 1933

J.S. Townsend, 1937

Also included is Young's certificate of Matriculation, October 1930, a letter from R. Baldick, February 1969, informing Young of his election to Membership of Pembroke Senior Common Room, and part of a draft letter from Young to A.B. Emden, 8 February 1974, re his Royal Society Fellowship.

A.7 — Form of Appointment as a Departmental Demonstrator in the Department of Physics (Electrical Laboratory), Oxford, 9 October 1933.

This appointment was for one year, under the Wykeham Professor of Physics, J.S. Townsend.

A.8 — Copy of thesis presented for B.Sc. degree, Oxford, 1934. 15 pp. typescript entitled 'The Electric Discharge in Nitrogen at pressures between Atmosphere and 10 cms. of Mercury'.

Folder also includes ms. notes and diagrams found with the thesis and the official notification of Young's acceptance as a student for the Degree of Bachelor of Science, 29 November 1933.

Biographical and personal

A.9 Letter from the Headmaster, The Dragon School, Oxford, 5 March 1934, thanking Young for substituting for one of their regular teachers.

A.10 Testimonial from the Warden of Radley College, 1934. (Young held a temporary post there during the Easter term.)

A.11 Correspondence and testimonials from R.V.H. Roseveare and P. Fletcher, Headmasters of The College, Cheltenham, 1934-38. (Young taught elementary biology, chemistry and physics there during this period.)

A.12 Material re the Sudan, 1938-40.

Young was appointed to the post of Assistant Meteorologist in the Sudan Government Service in 1938, where his unit helped to develop a forecasting service for Imperial Airways' route from Cairo south through Khartoum to Mombasa. The outbreak of war led him to resign in 1940 ('after considerable difficulty') and he returned to England to volunteer as a pilot in Coastal Command. He was rejected on age grounds and went instead to join I.C.I.'s Engineering Department at Billingham.

Folder includes:

Letter of appointment, 7 July 1938.

Young's letter of resignation, 3 December 1939, and correspondence re possible employment in U.K.

A letter from the Civil Secretary, 10 April 1940: 'I am directed to say that His Excellency the Governor-General has given permission for Mr. A.J. Young to marry while on leave this year'. (In the event Young did not marry until 1946.)

Miscellaneous background correspondence, information, etc.

A.13 Brief correspondence re an application by Young to become a member of The Institution of Electrical Engineers, 1955, 1956.

A.14, A.15 Visit to Australia, July and August 1960.

In 1959 Young contracted a virus pneumonia during a visit to Moscow, and the consequent ill effects on his health lasted well into 1960. As a result it was decided that he should combine business with a long holiday, and pay a visit to I.C.I. of Australia and New Zealand Ltd. (ICIANZ).

Biographical and personal

A.14 Correspondence with L.W. Weickhardt (Technical Director) and W. Rintoul (Head of Instrument Section) of ICIANZ re arrangements for visit.

A.15 Ms. notes for an informal talk on the 'Future of Process Control' delivered to the Society of Instrument Technology in Melbourne, 4 August 1960.

2 sets of notes, 2 pp. and 4 pp.

A.16 Royal National Institute for the Blind. Scientific Development Committee.

Young was asked to serve on the Committee in 1965, particularly in order to advise on electronic equipment and instrumentation, and resigned in 1975.

Brief correspondence with officers and committee members only.

A.17 National Physical Laboratory. Glazebrook Committee.

The Glazebrook Committee was set up under the Chairmanship of Sir James Taylor to consider the role of the National Physical Laboratory in the field of instrumentation.

Young was a member of the Committee, 1966-68. In 1967 he was asked to present a short paper to a meeting of the Committee on 21 November which was devoted to a discussion of the exploitation of instruments invented in the Laboratory.

Correspondence with Oliver Simpson, Deputy Director, re arrangements for delivery of paper, and with A.W. Foster, I.C.I., re contents of the paper.

9 pp. ms. notes for paper.

A.18 Correspondence, 1968-69, re conferment of honorary degree of Doctor of Technology, Bradford University, 26 April 1969.

A.19 Correspondence re award of Sir Harold Hartley Medal, 1969.

Young was the first recipient of this medal which was awarded by the Institute of Measurement and Control (see A.30). The award was presented on the occasion of the Institute's Silver Jubilee Dinner, 9 May 1969.

Correspondence is mainly with David Nutting (President, Institute of Measurement and Control) and Sir Harold Hartley, and includes autobiographical reminiscences by Young.

Biographical and personal

A.20 Correspondence with Sir Harold Hartley and Sir Ronald Holroyd re proposal of Young for Fellowship of the Royal Society, 1969.

Includes miscellaneous autobiographical notes by Young. (See also A.2, A.25, A.26.)

A.21 Letter from the Chairman of I.C.I. congratulating Young on the completion of 30 years' service, May 1970.

A.22-A.24 Visit to Australia, November 1970-March 1971.

As with Young's previous visit to Australia (see A.14, A.15), the main reason for the journey was medical (the necessity of avoiding the possibility of catching bronchitis in the British winter soon after a serious operation), but it was also arranged that he should visit ICI/ANZ and deliver a paper to the Engineering Institutions in Australia (see A.24).

A.22 Correspondence re the visit with I.C.I. personnel and others, 1970-71.

Includes itinerary, programme of visit, etc.

A.23 Brief notes on ICIANZ by Young and another.

A.24 'Chemical Plant Control Systems: Now and in the Future'

2 typescript drafts, one with ms. annotations, of paper delivered by Young to a joint meeting of Engineering Institutions, Melbourne, 1 December 1970. Miscellaneous background correspondence is also included.

A.25 Brief correspondence and ms. autobiographical notes re proposal of Young for Fellowship of the Royal Society, 1971. (See also A.20.)

A.26 Letters of congratulation re Young's election to Fellowship of the Royal Society, 1972. (2 only: the rest have not survived or are with the general correspondence in Section D.)

A.27 Correspondence, 1972, re possible visit by Young to the University of the West Indies in 1973. (Young was at first interested but later had to withdraw.)

Biographical and personal

A.28 Ms. draft for speech delivered by Young at his leaving presentation on the occasion of his retirement from I.C.I. in March 1973.

Includes a brief article about Young published in I.C.I. Head Office News, April 1973, photographs of the presentation ceremony, and Young's first pay slip from I.C.I.

A.29 Good wishes to Young on his retirement. Some of the letters contain biographical comments and reminiscences.

A.30 Institute of Measurement and Control (formerly Society of Instrument Technology Ltd.)

Brief correspondence and committee papers re Awards and Prizes Committee, of which Young was Chairman. 1977.

Also included are programmes of the 1955-56, 1956-57 sessions of the Society of Instrument Technology Ltd., of which Young was currently President.

A.31 Council for National Academic Awards (CNAA).

Young was a member of the CNAA Chemical, Instrumentation and Systems Engineering Board (formerly Instrumentation and Control Engineering Board), 1967-78. Papers relating to this service are held by CNAA.

Brief correspondence, 1977-78, including letter of thanks from CNAA, 1 February 1978.

A.32 Book of cuttings containing several reviews of Young's book, An Introduction to Process Control System Design (Longmans, 1955) and other material assembled by Young re himself and I.C.I.

See also C.27.

A.33 Small notebook apparently used by Young during a trip to the U.S.A. Contains details of travel arrangements, people/places visited, etc. n.d., possibly 1963 (see B.33).

A.34 I.C.I. desk diary, 1970.

A.35 I.C.I. desk diary, 1971.

A.36 I.C.I. desk diary, 1972.

Biographical and personal

A.37 Miscellaneous drafts for poems, some on pages of 1967 diary.

Miscellaneous drafts for short stories, one dated 1945.

A.38 Notes and drafts for talk or article on Pascal and Voltaire, n.d.

Drafts of talk or article on Alfred Kastler written on pages of 1973 diary.

A.39 Miscellaneous drawings and sketches, some done in S. Africa.

A.40 Ms. notes by Young on symptoms of his illness. They are undated but some are written on the back of grant application forms (not Young's) dated 1977.

Some correspondence re Young's health is also included here, 1959-77.

A.41 Miscellaneous personal correspondence, including some of biographical interest, 1954-75.

A.42 Miscellaneous photographs.

SECTION B — CENTRAL INSTRUMENT RESEARCH LABORATORY, IMPERIAL CHEMICAL INDUSTRIES LTD. (I.C.I.) (B.1 - B.210)

A note on nomenclature

The Central Instrument Research Laboratory went through several changes of name during Young's Directorship. It started life at The Frythe, Welwyn Garden City, when it was called the Central Instrument Section. It was moved to Bozedown House, near Reading, in 1956 and changed its name to the Central Instrument Laboratory, later becoming the Central Instrument Research Laboratory (CIRL), the name by which it was most commonly known. Several other names were suggested for it during the 1960s (see especially B.20) but it remained unchanged until the merger with the Petrochemical and Polymer Laboratory at Runcorn in 1972, after which it became known as the Corporate Laboratory.

B.1 'Brief Notes on the History of the Development of the Laboratory' by C.A.J. Young.

7 pp. typescript dated 'August 1969. Revised June 1971'. On the first page there is an annotation 'Note given to David Fishlock, Financial Times, 8.10.71.'

Miscellaneous background notes.

Typescript memorandum, 'Some Notes and Observations on Discussions with AE & CI Staff' by C.A.J. Young, 23 March 1972. Contains a survey of current developments in process control research in I.C.I. and a brief account of the development of the Central Instrument Research Laboratory.

B.2 Various descriptions of the history and function of the Central Instrument Laboratory, 1962, 1963. Two of these are by Young, the rest are unattributed.

3 sets of ms. notes on the laboratory in Young's hand.

B.3 Extract from the minutes of the First Meeting of the I.C.I. Committee on Instrumentation, 30 November 1945, at which it was decided that:

> 'A general instrument research and development section should be set up to act as a service to all Divisions, to deal with special problems, act as focus for information within ICI, keep in touch with instrument practice at home and abroad, and hold certain specialised equipment for general use in ICI ..... Action: Mr. F.E. Smith [later Sir Ewart Smith] to follow up the proposal to set up a central instrument laboratory'.

See B.36 for a set of minutes of the I.C.I. Committee on Instrumentation.

Central Instrument Research Laboratory I.C.I.

B.4 Memorandum from A.J. Young to the Technical Director, I.C.I., entitled 'Organisation and functions of the Instrument Section of the Technical Department'.

15 pp. typescript, dated 3 August 1948.

B.5 Draft of memorandum by Young recommending that the staff strength of the Central Instrument Section should be increased.

12 pp. ms., n.d., early 1950s.

B.6 'Report on Instrumentation for the Technical Director'.

Typescript memorandum from Young to Sir Ewart Smith, 30 March 1953.

B.7 Typescript memorandum by Young, 29 June 1954, entitled 'Central Instrument Section. Establishment and Accommodation' recommending that the laboratory should be moved from The Frythe at Welwyn to larger premises at Bozedown House, near Reading, where it remained until 1974 when it was moved to Runcorn following amalgamation with the I.C.I. Petrochemical and Polymer Laboratory in 1972.

B.8 Miscellaneous background notes by Young re cost of the move, etc.

B.9 'Objectives of Central Instrument Section Control Programme'.

Typescript memorandum from Young to 'All Instrument Managers', 7 March 1955.

B.10 Notes on the Central Instrument Laboratory's long-term development programme, by members of the Laboratory. November-December 1957.

B.11 'Notes on the Central Instrument Laboratory's activities'.

Typescript memorandum from Young to J.P.W. Lewis, 17 December 1957.

2 drafts of an undated typescript memorandum from Young to the Technical Director and the Engineering Controller arguing for the eventual establishment of a Central Laboratory working in the fields of process development and chemical engineering. On the front of the first draft is a note by S.T. Lunt 'Probably drafted in late '57 or early '58'.

Central Instrument Research Laboratory I.C.I.

B.12 Memorandum from Young to the Technical Director and the Engineering Controller, 17 January 1958, on 'Extension of Activities of the Central Instrument Laboratory'.

Also included is a letter from Young to the Technical Director (R. Beeching), 3 February 1958, headed 'Discussion of Organisation of Process Improvement'.

B.13 Typescript memorandum from Young to the Engineering Controller, 25 February 1959, outlining the number of staff in the Central Instrument Section, and their distribution.

Miscellaneous ms. notes by Young on staff structures are also included here.

'Notes on the Present and Future Programme of the Central Instrument Laboratory'.

2 pp. typescript by Young, 3 December 1959.

B.14, B.15 Correspondence re expansion of accommodation at Bozedown House, 1963-65. Includes a few notes re staff, etc.

B.14 1963-64.

B.15 1965.

B.16 'Notes of Meeting on Friday, 7th February, 1964, to Discuss Instrument Development Policy'.

2 pp. typescript account of a discussion between Young and J.R. Halsall.

B.17 'Central Instrument Research Laboratory Programme, 1965-1970'.

Undated typescript by Young.

B.18 Correspondence and memoranda re the desirability of moving the whole or part of the Central Instrument Research Laboratory from Bozedown to Runcorn, June-August 1965.

Includes memorandum by Young arguing strongly against the move, 3 August 1965.

B.19 'The Future of the Central Instrument Research Laboratory Related to Divisions and Head Office Departments'.

Typescript memorandum by Young, 16 September 1965. Includes a suggestion for changing the name of the Laboratory to 'Central Engineering Research Laboratory'.

Related correspondence is also included here.

Central Instrument Research Laboratory I.C.I.

B.20 Various drafts of remits for the Laboratory and for Young himself, 1965-66.

Miscellaneous notes re possible re-naming of the Laboratory, 1966, 1970 are also included here.

B.21 Correspondence re future plans for the Central Instrument Research Laboratory and for Young's own position in I.C.I., 1969, 1971.

B.22 'Review of CIRL work during the Ten Years 1961-71' by Young and R.L. Day, 22 July 1971.

B.23 Memoranda by members of the Laboratory re the development of the Corporate Laboratory research programme during the ten years following 1972.

B.24 'A Proposal for the Long-Term Research Programme of Corporate Laboratory (B)'.

Typescript by Young, 10 July 1972.

Also included are 2 pp. typescript notes with ms. corrections in Young's hand 'for memorandum on: Consideration of the future of the Corporate Laboratory', n.d.

B.25 'Management brief' from D.G. Jones, announcing the move of the Corporate Laboratory at Bozedown to Runcorn, 30 August 1972.

B.26 Memoranda re the future of the Corporate Laboratory, September 1972 and March 1973.

B.27 Arguments against the move of the Bozedown Laboratory to Runcorn, 1973.

Includes ms. notes by Young.

B.28 Miscellaneous memoranda from members of the Laboratory to Young, 1955-70, and many undated, re future plans and programme of the Laboratory.

B.29-B.34 Notebooks used by Young at I.C.I.

6 duplicate books containing miscellaneous jottings, calculations, memoranda, draft reports, letters, notes for meetings, lectures, etc.

B.29 1955-57.

B.30 1955-58.

Central Instrument Research Laboratory I.C.I.

B.31 1959, 1962.

B.32 1960, 1963.

B.33 1963. Much of the material in this book refers to a visit by Young to U.S.A., November 1963.

B.34 1965.

B.35-B.38 I.C.I. Committee on Instrumentation.

Young's own account of this committee in A.2 runs:

'Sir Ewart Smith set up the I.C.I. Committee on Instrumentation, and successive I.C.I. Technical Directors took the Chair of the Committee until formal committee organisations fell out of favour in the Company and it was dissolved: throughout its life I was Secretary of the Committee.'

The first meeting was held on 30 November 1945, with an Acting Secretary, Mr. G.F. Whitby. At the second meeting, 19 March 1945, Young was appointed Permanent Secretary. The Committee held 24 meetings (Mr. J.D. Tallantire was Secretary from meeting 22) to 18 May 1961, when it was reconstituted to allow Divisional meetings 'with local "user" staff taking part'.

A summary of the development and activities of the Committee, compiled in 1961 by J.D. Tallantire, is included as a separate item at B.35.

B.35 Summary of the development and activities of the Committee, by J.D. Tallantire, 1961.

13 pp.

B.36 Photocopies of Minutes of meetings 1-24, November 1945-May 1961.

B.37 Photocopies of Minutes of meetings on Instrumentation, held at various Divisions and locations, and with various secretaries, May 1963-1971; Young attended these as representative of CIRL.

B.38 Brief correspondence with J.D. Brown re the future of the Instrumentation Committee, November 1961.

B.39 'Informal Meeting of Instrument Users on 1st July 1946'.

Notes on the Agenda by Young, addressed to Sir Ewart Smith.

4 pp. typescript.

Control Instrument Research Laboratory I.C.I.

B.40-B.46 Portable Pneumatic Analyser.

The following items were originally kept together in a bulky folder labelled 'Automatic Control. Pneumatic Analyser'. They have been placed in several smaller folders for ease of handling. The original folder is at B.40.

The experimental work covered below is described by S.T. Lunt as follows: 'Quantum Process Analysis was carried out by injecting a sinusoidal disturbance into the opened control loop using an equipment called a Portable Pneumatic Analyser ... These experiments were almost certainly the first such types of analysis carried out in the world on field-scale production chemical plants, using intentionally injected sinusoidal signals'.

B.40 Typescript series of memoranda by C.I. Rutherford and A.R. Aikman on experiments with the Pneumatic Analyser at various I.C.I. plants, May 1948-October 1949. Includes a summary of the results prepared for the Ninth Meeting of Panel 'A' of the I.C.I. Committee on Instrumentation.

B.41 Further memoranda on the Pneumatic Analyser by A.R. Aikman, November 1949-June 1950, including a summary for the Tenth Meeting of Panel 'A' of the I.C.I. Committee on Instrumentation.

B.42 2 reports by A.R. Aikman:

'Automatic control of propane still at oil works, Billingham Division'.

Typescript draft (16 February 1950) and final version, August 1950.

'Automatic control of calciners at Billingham Division'.

Typescript draft (2) February 1950) and final version, August 1950.

Folder includes advance copy of a paper by C.I. Rutherford on 'The practical application of frequency response analysis to automatic process control', published by the Institution of Mechanical Engineers, 1950.

B.43 Report entitled 'A portable pneumatic analyser', by A.R. Aikman and J.R. Halsall, 23 April 1951.

A letter from Young, dated 29 June 1951, introducing the report to members of the I.C.I. Committee on Instrumentation is also included.

Central Instrument Research Laboratory I.C.I.

B.44 Correspondence with J. McMillan and C.G. Mills re modifying and improving the analysing equipment, October-December 1955.

B.45 'Pneumatic sine wave generator operation and maintenance manual', by T. Chenevix-Trench.

Typescript draft with ms. corrections, November 1962.

B.46 Correspondence with I.C.I. Alkali (Australia) re design of sine-wave generators, 1963.

Central Instrument Research Laboratory I.C.I.

B.47-B.52 Work on plant dynamics and development of control system design methods, 1955-61.

B.47 2 pp. typescript notes summarising the results of a meeting of representatives of I.C.I. Alkali Division and the Central Instrument Section to discuss the process control research programme, 5 October 1955.

B.48 Letters and memoranda from J. McMillan and P.C. Price to Young, 1956-61, reporting results and outlining future plans re work on plant dynamics and control system designs. Memoranda are in ms. and typescript and some are annotated by Young. Some of the progress reports, etc. referred to by McMillan have not survived.

B.49 Miscellaneous correspondence and memoranda re control system design, etc., 1957-60.

Includes a letter from M. Masubuchi, 19 June 1958, enclosing a reprint in Japanese with accompanying notes in English.

B.50 Correspondence and memoranda, mainly from J. McMillan, re work on boiler plant control systems, 1956-57.

B.51 Correspondence re HCN control system design, October-December 1960.

B.52 6 pp. ms. memorandum from J. McMillan to C.H. Bowden, dated 19 November 1957, and headed 'The Next 10 years. Dynamic Characteristics of Physical Processes (and related subjects)'.

Central Instrument Research Laboratory I.C.I.

B.53-B.69 Investigation of chemical processes.

Young's own description in A.2 of the development of the work of the Laboratory to the mid-fifties runs as follows:

'We set out to design process control systems using the theory developed before and during World War II by the servo-mechanism people; e.g. for the control of anti-aircraft guns. We found at once that the theory could not be applied quantitatively, because the dynamic characteristics of the process and plant to be controlled were not known. We set about determining these characteristics from theoretical and empirical considerations. We made equipment and developed techniques for comparing our predictions with the response of actual processes. After some substantial work on the physical (separation) processes, primarily distillation, with fair results in simple cases, we decided to tackle the heart of the process, namely, the chemical reaction and the reactor.'

The contents of the following folders relate to various chemical processes studied by members of the Central Instrument Laboratory.

B.53 Ammonia.

Reports, memoranda, all undated.

B.54 Butadiene.

Correspondence, progress reports, notes of meetings, 1966-67.

B.55 Chlorine.

Correspondence, reports, memoranda, notes of meetings, 1965-67.

B.56 Ethylene.

Correspondence, reports, notes of meetings, 1959-69.

B.57 K.A. (Cyclohexane).

Reports, research proposals, 1955-66.

B.58 Methionine.

Memoranda, notes of meetings, 1966-67.

B.59 Nylon.

Progress reports, December 1962-October 1966.

Central Instrument Research Laboratory I.C.I.

B.60-B.62 Nylon.

Correspondence, reports, notes of meetings.

B.60	1962
B.61	1963
B.62	1964-67

B.63 Paraxylene.

Correspondence, reports, notes of meetings, 1962.

B.64 'Transchem' and Chloromethane.

Memoranda, reports, research proposals, 1955-62.

B.65 Ms. memoranda from C.H. Bowden to Young re chemical kinetics projects, 1957-67.

B.66 Ms. memoranda from C.H. Bowden to Young, similar to above but undated.

B.67 Ms. and typescript memoranda from R.L. Day to Young, 1961-64.

B.68 Reports by members of the Laboratory on various aspects of work on chemical kinetics, 1963-72.

B.69 Miscellaneous related material: brief correspondence, notes on future plans, etc.

Central Instrument Research Laboratory I.C.I.

B.70-B.115 Analogue and digital computers.

Young's account in A.2 of the developments which led I.C.I. to purchase its first computer runs as follows:

'When we had established the mechanism of a physical or of a chemical process and could represent its behaviour (to a sufficiently close approximation for design purposes) by a set of mathematical equations (which came to be known as the "mathematical model" of the system), we were at once faced with the difficulty of using the result; which required solving the equations. It was clear that substantial progress could be made only by using the electronic computer: then a new tool. First we used the Ferranti MERCURY (Digital) computer at Manchester University and various analogue computers, as far afield as Bergen. We then set up an analogue computer at Bozedown ... and a digital computer at Wilton Works ... We provided a complete analogue and digital computing service for the whole of I.C.I.: with a mixed team of mathematicians, engineers and chemists to bring the facilities of this service to the notice of their divisional colleagues, and to assist them in using it. Another team was responsible for developing the service itself, particularly building up the library of programmes and developing the "software" generally.'

The following papers document many of these developments.

B.70 Correspondence re visit to U.S.A., February-April 1955, by R.A.E. Ellis and A.P.C. Murrell to investigate American techniques in digital computers, components and related devices, and their technical applications.

Includes an exchange between Ellis and Young to clarify purpose of visit; letters of introduction from Young to various American contacts; letters from Ellis reporting on progress.

B.71 Memorandum from R.A.E. Ellis to Young, 18 November 1955, re a visit to Ferranti Ltd, to discuss the purchase by I.C.I. of a digital computer for distillation column control. (I.C.I. bought a Ferranti Mercury in 1958.)

B.72 'The use of Computers in Kinetic Calculations. Gas-phase Tubular Reactor Kinetics Involving Differential Fouling of Heat Transfer Surface' by R.E. Gee and others of E.I. du Pont de Nemours and Company.

15 pp. typescript plus additional pages of diagrams.

S.T. Lunt writes of this paper: 'I have put it in the collection specifically because it triggered off an important development in the Central Instrument Laboratory. It was as a result of

Cont'd ...

Central Instrument Research Laboratory I.C.I.

reading this paper, coupled with my own experience in the design of the Wilton Nylon plant, that I decided to investigate the role of computers for technical calculations in ICI.

This programme of work in turn led directly both to the purchase by ICI of a Ferranti Mercury digital computer for general purpose calculations and to the opening up of the field of work on chemical kinetics and their relation to process development in plant design.'

B.73 '"Mercury" Computer. Proposed Organisation at Wilton'.

5 pp. typescript draft by S.T. Lunt, 1 July 1957.

Folder also includes some ms. notes by Young.

B.74-B.77 Memoranda re use of on-line digital computers for process control by staff of the Central Instrument Laboratory. They are all in typescript, some with covering letters, and dated 1958-61. Authors are as follows:

B.74	D.W. Gillings	1958-61
B.75	J. McMillar	1961
B.76	R.A.E. Ellis	1961
B.77	Misc. unsigned material.	

B.78 2 pp. typescript headed 'Notes on Talk to Engineering Conference', n.d. Brief progress report on the work of the Central Instrument Laboratory, including the Laboratory's use of computers.

Correspondence with the Chairman of I.C.I. re his visit to the Central Instrument Laboratory's Digital Computer Section at Wilton, May 1962.

B.79 Memorandum from Young to E.G. Williams headed 'Company Policy on Facilities for Digital Computation', 13 June 1962.'

Included here is a copy of a request to the Divisions to assess the profitability of work carried out using the Mercury computer and the rate of increase of their computing loads over the next 2 or 3 years.

Control Instrument Research Laboratory I.C.I.

B.80 Material re a meeting between I.C.I. and International Systems Control, 6 July 1962.

Includes:

Memorandum from Young to the Technical Director, I.C.I., headed 'Computer Control/International Systems Control', 26 June 1962.

Unofficial reports on the meeting by Young, H.H. Robertson and M. Jones.

Central Instrument Research Laboratory I.C.I.

B.81-B.88 Purchase of the English Electric KDF 9 Computer.

B.81 Papers relating to I.C.I.'s computer policy and the Central Instrument Laboratory's case for the installation of the KDF 9 to replace the Ferranti Mercury as a central computing service.

Includes:

'Aide mémoire for meeting with the Technical Director'.

4 pp. typescript by Young, 9 May 1962.

'Memorandum for the Technical Director. Communications in the Company's computing system'.

10 pp. typescript by Young, 25 May 1962.

'Steps toward a Company policy on computer development'.

3 pp. typescript by G.E. Thomas, 5 July 1962.

B.82 2 'Expenditure Proposals' advocating the purchase of an English Electric KDF 9 computer and associated equipment. One is dated 14 August 1962, and the other is stamped 'For the next Capital Programme Committee Meeting. Circulated on 5 October 1962'.

B.83 Memoranda by G.E. Thomas, 9 March and 17 September 1962, proposing that the Ferranti Mercury be replaced by the English Electric KDF 9.

B.84 'A note on views expressed at the Computer Information Group meeting held at Wilton on 21 May 1963 to discuss the KDF 9 installation'.

13 pp. ms. by M.J. Box.

Folder also includes official minutes of the meeting.

B.85 Draft of memorandum by Young to the Engineering Controller headed 'Central Instrument Laboratory/Proposal to extend the KDF 9 system'.

Typescript with ms. corrections in Young's hand, 13 July 1964.

B.86 Photocopies of letters from various I.C.I. Divisions commenting on the proposal to extend the KDF 9 computer. Most of these were written in answer to a memorandum from Young, dated 26 May 1964, which has not survived.

Central Instrument Research Laboratory I.C.I.

B.87 Memorandum from Young to the Organisation and Services Director re extension of the KDF 9.

2 copies of typescript draft both with extensive ms. corrections by Young, 20 July 1964.

B.88 'Proposal to extend the KDF 9', by G.E. Thomas.

7 pp. typescript, 20 July 1964.

'Extension to the Wilton KDF 9', by B. Richards.

2 pp. typescript, 24 July 1964.

Includes brief covering note to Young.

Central Instrument Research Laboratory I.C.I.

B.89 Memorandum from Young to the Engineering Controller recommending the purchase of at least 5 Ferranti Argus 104 computers, 25 March 1964.

B.90 Correspondence with P.D. Aylett and C.M. Cundall of Ferranti Ltd., 1966-67, mainly re Argus 100 and 400 computers.

B.91 'Development of the Application of On-line computers to Increase Process Profitability', by A.J. Young, 6 February 1968.

25 pp. typescript with some additional pages.

B.92-B.94 Ferranti/I.C.I. Press Conference, 2 May 1968.

This was arranged to demonstrate the use of the Ferranti Argus 400 as a shared process control computer, and to highlight Ferranti/I.C.I. collaboration. The Press Release was designed to coincide with the news that I.C.I. had ordered a ninth Argus 400.

B.92 Correspondence, February 1968, mainly with C.M. Cundall.

B.93 Notes on meeting, 19 March 1968, to make arrangements for the Press Conference; provisional invitation list; timetable; typescript notes for Young's introductory address; typescript of address as delivered.

B.94 Amended copy of address for publication; Press Releases; press-cuttings; descriptions of equipment demonstrated to the Press.

Central Instrument Research Laboratory I.C.I.

B.95-B.102 MEDIA and RTL projects.

R.L. Day and A. Spinks in their Memoir of Young (Biographical Memoirs of Fellows of the Royal Society, 25, 1979) write:

'Later in the 1960s it became increasingly apparent that although the cost of the computer itself was decreasing at a rapid rate the cost of installing a total on-line computer system was not, and if anything was rising because of the increasing costs of software and the high cost of interface equipment to connect the computer to the process. Christopher was also concerned by the fact that virtually all computer manufacturers were developing software and interface hardware that were largely incompatible, and by the resulting inefficient handover and rapid obsolescence of systems. This led him to create two new major research initiatives, one aimed at a special high level programming language designed for on-line (i.e. real time) applications RTL (Real Time Language), and the other aimed at a novel system of interface instrumentation MEDIA (Modular Electronic Digital Instrumentation Assemblies). Besides reducing the costs of implementing a complete on-line system both these initiatives shared a further objective, i.e. to be as far as possible "machine independent" and hence to be free from built-in obsolescence.'

The following papers relate to work on both these projects.

B.95 2 memoranda related to the development of MEDIA:

'Digital instrumentation for process measurement and control' by A. Murrell.

4 pp. typescript with annotations by Young, 21 September 1967.

'Proposed investigation into the stability and accuracy of electrical output transducers and measuring systems' by J.R. Halsall.

4 pp. typescript, n.d.

B.96 'Project 4247 - MEDIA. Summary of working notes'.

56 pp. typescript, n.d. c.1968.

'Project 4247. Summary of working notes II'.

16 pp. typescript by 'K.P.', 13 August 1969.

Central Instrument Research Laboratory I.C.I.

B.97 Minutes of a meeting to discuss MEDIA, held at the Central Instrument Research Laboratory, Bozedown House, 24 March 1970.

B.98 Miscellaneous correspondence re MEDIA, 1969-72.

B.99 Miscellaneous material relating to MEDIA.

Includes:

Proposal by Metra Consulting Group to investigate the world market for process control electronics, June 1969.

Brochure re MEDIA produced by I.C.I.

Timetable for visit of Advanced Engineering Research Working Party to be introduced to MEDIA, 20 August 1970.

B.100-B.102 RTL.

B.100 'Group III. Techniques Section. Progress Report May-July 1969' (contains section on 'Real Time Language - Definition').

'Development of basic software for on-line computers', by I. Gray, 10 September 1969.

'Real-Time Language Project'.

31 pp. typescript by 'K.D.T.' (K.D. Tocher), December 1970.

B.101 Correspondence with I. Gray re possible collaboration with other companies in the development of RTL, November 1970-February 1971. Much of this is in the form of telexes since Young was in Australia during this period (see A.22-A.24).

B.102 Notes on meetings between I.C.I. and British Steel Corporation, December 1970-January 1971.

Central Instrument Research Laboratory I.C.I.

B.103-B.110 Purchase of English Electric M2140.

B.103 Spiral bound booklet entitled 'Computing Plans 1968 leading up to Form A for 2140 and System 470'.

Contains ms. and typescript drafts and notes. Some of the material is duplicated, with minor differences, in B.104.

B.104 Draft proposals for the purchase of the M2140. These include:

10 pp. typescript, probably by I. Gray, with ms. corrections by Young.

Second draft of the above.

8 pp. typescript headed 'Central Instrument Research Laboratory. Computing Plans: August 1968'.

3 pp. typescript by I. Gray with note 'Herewith another draft of a possible proposal document for the computer'.

B.105 Final version of 'Expenditure Proposal', and 'Research Expenditure Memorandum'. The latter is dated 21 November 1968.

B.106 Miscellaneous correspondence re the M2140, August 1967 (with the English Electric Co. Ltd.) and May-September 1968 (with I.C.I. personnel - some letters are photocopies).

B.107 'M2140 Planning Group'. Minutes of 1st and 2nd meetings, 30 April and 7 May 1968.

Included here is a report on a visit to English Electric to discuss the M2140, 9 May 1968.

B.108 Miscellaneous technical data re the M2140.

B.109 2 project notes re the M2140:

'M2140: Super Instrument System', by I. Gray and A.J. Cobb, 14 March 1972.

'M2140: Laboratory Instrument System', by A.J. Cobb, 30 May 1972.

The second of these appears to be a revision of the first.

B.110 2 reports on the history of the M2140 project by I. Gray, June 1972.

Central Instrument Research Laboratory I.C.I.

B.111 Chemical Engineering Programmes.

In 1963 the Central Instrument Laboratory took the responsibility for organising a library of computer programmes for chemical engineering design calculations. Later this responsibility was handed over to the Management Services Department, but in 1969 the Central Instrument Laboratory was asked to reassume responsibility for the library.

Folder contains brief correspondence and related papers, 1960, 1963, 1969.

B.112 Miscellaneous material re analogue computers, 1958-70. Includes:

24 pp. typescript with additional ms. pages advocating purchase of P.A.C.E. analogue computer, 1958.

2 pp. ms. memorandum from C.H. Bowden to Young re analogue computer symposium for I.C.I. personnel, 1959.

Progress report on analogue computing, December 1962-March 1963, by M.W. Sage.

Report of I.C.I. Advanced Engineering Research Working Party Working Group on Compressors, 18 August 1970 (analogue computer simulation was used to investigate suction pressure control schemes).

B.113 Miscellaneous correspondence re analogue and digital computers, 1958-72.

B.114 Miscellaneous reports, memoranda, etc. (some incomplete).

B.115 Undated ms. notes by Young recording some impressions during a visit to U.S.A. to study the use of on-line computers.

Central Instrument Research Laboratory I.C.I.

B.116 Correspondence, 1959-64, re mathematics and mathematicians in I.C.I.

Includes:

Letter from I. Grey, 7 March 1961, containing a summary of current and future work under the heading 'Mathematical Services'.

Extract from the Board Minutes of Dyestuffs Division, 23 November 1963, recording that 'Particularly for the purpose of making maximum use of computer techniques on both commercial and technical problems, it has now been agreed by the Executive Committee that it will be to the Division's advantage to form a new department within which all mathematicians can be drawn together in one group'.

Correspondence re possible building alterations to accommodate a Mathematics Section at Bozedown House, 1964.

B.117 2 papers re mathematics in I.C.I.:

'Programme for the study and development of mathematical techniques, 1962'. Unsigned typescript.

'Mathematics in ICI'. Unsigned typescript, n.d., c.1962.

B.118 Miscellaneous mathematical papers by H.H. Robertson and W.R. Johns, 1962-73.

Central Instrument Research Laboratory I.C.I.

B.119-B.129 Economics of Process Control.

The following papers relate to attempts, mainly by D.W. Gillings, to demonstrate the economic value of improved measurements and control of chemical processes. Early correspondence (1955) mentions the possible formation of an 'Economics' team, and later on the Central Instrument Laboratory had an official 'Technical Economics Section' (see especially B.120).

B.119 General correspondence and memoranda re economic analysis, 1955-71. Of particular interest is a letter from G.E. Thomas, 25 November 1955, outlining ideas about purpose and methods, and a possible future programme for the 'Economics' team.

B.120 Descriptions and résumés of the work of the Technical Economics Section of the Central Instrument Laboratory, 1963, 1964, 1965, and several undated.

B.121 2 pp. typescript by D.W. Gillings headed 'Economic modelling at Bozedown House (and before !!)', outlining progress in work on economic analysis in I.C.I. 1954-70.

B.122 'Draft memorandum to the Technical Director. Subject: D.W. Gillings's Economic Studies'.

6 pp. typescript, unsigned and undated, presumably by Young, c.1962-63. Outlines work done by Gillings, 1958-61.

B.123 Typescript draft with ms. notes and corrections annotated in Young's hand 'Economics Notes by D. Gillings September 1956'.

Also included are pp.16-18 of another typescript which were found with the draft.

B.124 Ms. and typescript notes, memoranda and rough drafts, mainly by D.W. Gillings, re various aspects of work on the economics of process control. The majority of the papers are undated, but the few dated ones cover the period 1959-63.

B.125 Typescript drafts by D.W. Gillings for research proposals, progress reports, etc., 1958-65.

Central Instrument Research Laboratory I.C.I.

B.126 Reports on visits to U.S.A. by D.W. Gillings, 1962 and 1964, to investigate 'the actual place of engineering economic analyses and related work in current U.S. industrial practice'.

B.127 Research reports by D.W. Gillings, 1963-64.

B.128 Miscellaneous diagrams and tables, probably prepared for some of the above drafts and reports.

B.129 2 memoranda on economic analysis:

'An application of analogue computing to plant and process economic estimation'. (Typescript draft, no author or date.)

'The analysis of project profitability', by A.C. Hutchison, 22 May 1962.

Central Instrument Research Laboratory I.C.I.

B.130 Correspondence re patent applications by Central Instrument Laboratory personnel, 1958.

Includes drafts and diagrams for patent specifications.

B.131 Memorandum from J.R. Halsall to Young, May 1962, re possible visit by Halsall to the U.S.A. to study American developments in instrumentation.

B.132 Miscellaneous reports, memoranda, etc. by J.R. Halsall, F.B. Shepherd and W.A. Boyes on various aspects of instrumentation, 1962-63.

B.133 Memorandum by T. Chenevix-Trench on 'Microwave Techniques for the Measurement of Low Moisture Content', 15 January 1964.

B.134 Brief correspondence re Mond/Central Instrument Research Laboratory Symposium, 8 December 1966, on 'Some Growing Points in Process Research'.

Folder includes programme, typescripts of papers delivered, etc.

B.135 Correspondence, mainly with the Royal Society, re arrangements for visit by Vladimir G. Lazarev and V.A. Lvov (both from U.S.S.R.) to the Central Instrument Research Laboratory, 1972.

B.136-B.138 Central Instrument Research Laboratory. Progress Reports.

B.136 1955, July-December 1957, 1955-57 (ms. draft in Young's hand), 1961.

B.137 1966, 1969.

B.138 Central Instrument Research Laboratory. Group II. Progress reports: September 1968, September-January 1969 (sic), April-June 1969, January-March 1970, January-March 1972.

B.139, B.140 Central Instrument Research Laboratory. Group III. Quarterly Progress Reports.

B.139 April-June, July-September 1969.

B.140 October-December 1969, January-March 1970.

B.141 Central Instrument Research Laboratory. Miscellaneous reports on various aspects of research.

Central Instrument Research Laboratory I.C.I.

B.142, B.143 Photocopies of formal 'project notes' submitted by members of the laboratory, 1967-70 (not indexed).

B.144, B.145 Memoranda re Laboratory's future research plans.

B.144 1957, 1962.

B.145 1966, 1967, 1968; 1969, 1970, 1971.

B.146-B.155 Central Instrument Research Laboratory. Budgets. Notes, drafts and memoranda re estimated and actual expenditure.

B.146 1952.

B.147 1956.

B.148 1957-58.

B.149 1959-61.

B.150 1962-64.

B.151 1965, 1966.

B.152 1967 (contains some papers re estimated expenditure 1967-70).

B.153 1967 ( ).

B.154 1968-73.

B.155 Miscellaneous, undated.

B.156-B.161 Miscellaneous correspondence and memoranda re Central Instrument Research Laboratory affairs, 1952-70.

B.156 1952-56.

B.157 1957.

B.158 1958-60.

B.159 1961-65.

B.160 1966-72.

B.161 Undated.

Central Instrument Research Laboratory I.C.I.

B.162-B.167 Administrative correspondence re Central Instrument Research Laboratory personnel, 1946-69.

Re appointments, salaries, etc. (not indexed).

B.162 A - B

B.163 C - L

B.164 L

B.165 M - N

B.166 O - W

B.167 Miscellaneous

B.168-B.176 Assessments of Central Instrument Research Laboratory staff, 1958-66 (not indexed).

B.168 1954?

B.169 1958.

B.170 1959.

B.171 1959-61.

B.172 1960.

B.173 1962.

B.174 1964.

B.175 1965.

B.176 1966.

Central Instrument Research Laboratory I.C.I.

B.177-B.210 I.C.I. Instrument Information Bulletin, 1956-62.

This Bulletin was originally issued as an experiment at the request of the Instrument Research Panel. Its object was 'to record available information on:

a) important papers, particularly if published in unfamiliar journals;

b) I.C.I. reports; especially those originating outside instrument sections;

c) information on development work (projected, in hand, or complete) by instrument manufacturers, research associations or other external bodies; and

d) information arising from proceedings at technical meetings or in committees, etc. and details of forthcoming events of special interest'.

The Bulletin was issued by the Central Instrument Section in monthly instalments designed for filing in ring binders with quarterly and annual indexes of contents, persons, subjects and companies. It was edited by various members of the Central Instrument Section in turn.

The final issue of the Bulletin was Vol.27, July 1962, its demise being attributed to 'current reorganisation of the activities in Head Office of the Central Instrument Section' (J.D. Tollantire, 8 August 1962. See B.209).

The contents of the binders are as received from the I.C.I. Corporate Laboratory.

B.177	Vol.1	January-March 1956.
B.178	Vol.2	April-June 1956.
B.179	Vol.3	July-September 1956.
B.180	Vol.4	October-December 1956.
B.181	Contents and Index, 1956.	
B.182	Vol.5	January-March 1957.
B.183	Vol.6	April-June 1957.
B.184	Vol.7	July-September 1957.
B.185	Vol.8	October-December 1957.
B.186	Contents and Index, 1957.	

Central Instrument Research Laboratory I.C.I.

B.187	Vol.9	January-March 1958.
B.188	Vol.10	April-June 1958.
B.189	Vol.11	July-September 1958.
B.190	Vol.12	October-December 1958.
B.191	Contents and Index, 1958.	
B.192	Vol.13	January-March 1959.
B.193	Vol.14	April-June 1959.
B.194	Vol.15	July-September 1959.
B.195	Vol.16	October-December 1959.
B.196	Contents and Index, 1959.	
B.197	Vol.17	January-March 1960.
B.198	Vol.18	April-June 1960.
B.199	Vol.19	July-September 1960.
B.200	Vol.20	October-December 1960.
B.201	Contents and Index, 1960.	
B.202	Vol.21	January-March 1961.
B.203	Vol.22	April-June 1961.
B.204	Vol.23	July-September 1961.
B.205	Vol.24	October-December 1961.
B.206	Contents and Index, 1961.	
B.207	Vol. 25	January-March 1962.
B.208	Vol.26	April-June 1962.
B.209	Vol.27	July 1962.
B.210	Contents and Index, 1962.	

SECTION C LECTURES, PAPERS, PUBLICATIONS, CONFERENCES (C.1 - C.29)

This Section contains a complete set of Young's publications up to 1969 as well as notes and drafts for unpublished material, mainly speeches. There is also a considerable amount of background material to a paper by Young on 'The Chemical and Petrochemical Industries' delivered at a Royal Society Discussion Meeting on 'Manufacturing Technology in the 1980's' and subsequently published in Phil. Trans. R. Soc. Lond. A, 1973 (see C.19 - C.25).

Various correspondence re publications, conferences, etc. is included at the end of the Section.

See also A.15, A.24, A.28 for other papers and speeches by Young.

C.1 Set of publications, numbered 1-37, with an accompanying list. The set is missing nos. 5 (but see C.2), 10, 15 and 24 (the last 3 are monographs), and was originally assembled in 1969 when Young was first proposed for Fellowship of the Royal Society (see A.20).

N.B. This item includes publications only up to 1969. See also C.19 - C.25.

C.2 Typescript drafts of part of a report on a visit to the U.S.A. to study the state of instrumentation in the oil and chemical industries. They are undated except for a pencil annotation on the front of the first, 'late 53 or 54' (but see below).

Young was a member of the O.E.E.C. Mission sent to the U.S.A. in 1950 to study 'chemical apparatus' and was particularly responsible for the study of standardisation in chemical engineering practice, process instrumentation and some unit operations. The report on the Mission was published in 1952, and Young's contribution (chapters on 'Standardisation' and 'Instrumentation') appears as no.5 in his list of publications in C.1, although it is missing from the accompanying set of papers.

It seems likely that these drafts were prepared for Young's contribution to the O.E.E.C. Report, particularly as mention is made of 'the Mission' in one of the drafts.

Lectures, papers, publications, conferences

C.3 11 pp. typescript headed 'The Development of Processes and the Design of Plant in the Chemical Industry'. It is unsigned, but annotated 'AJY Publications'. There is also an annotation by S.T. Lunt 'Not clear where, if anywhere, this was ever published. It is almost a verbatim copy of a note written by Lunt in (about) 1955'.

C.4 'Progress in Process Instrumentation'.

Following an introductory article in February 1957, Young contributed a monthly article under this title, using the pen-name 'Regulus', to The Industrial Chemist.

The series began in May 1957, and was 'designed to give the industrial chemist, or engineer in the process industries, a guide to trends in current practice in instrumentation and application technique'.

The last article in the folder is dated April 1964.

In the account of his work which appears in A.2, while drawing attention to his most influential publications, Young wrote:

'Among these publications I count a monthly review, in the "Industrial Chemist", as one of the more important. These reviews were published under the pseudonym "Regulus"; so that I could write completely freely without committing the Laboratory or the Company, or embarrassing them with my personal views. This was a well-kept secret outside the Company; but I have found subsequently that my own colleagues recognised my style at the outset? I am grateful to them for not telling me (and others) at the time.

'Each of these monthly reviews commenced with a serious attempt to provide the reader with guidance on appropriate current problems and questions: they also urged industry from time-to-time to help itself by providing case histories of profitable applications of control.

'The reviews in the "Industrial Chemist" ran for seven years until Mr. Cecil King took over the journal and closed it down. This was a great loss to the process industries: the editor, Dr. G. Hay Robertson had made the "Industrial Chemist" an excellent medium for most serious communication with people at all levels, and with all kinds of interests, in the Process Industry.

'The closure may have been economic for Mr. Cecil King's business: it must certainly have resulted in economic loss to the Process Industry.'

Lectures, papers, publications, conferences

C.5 Folder labelled 'Gordon Conference. Notes for what was actually said', containing 8 pp. typescript draft with ms. annotations and additional pages of ms. notes. These are presumably for the paper on 'Developments and Trends in Process Control in Europe' delivered at the Gordon Conference, New London, 1958 (see C.1).

C.6 Lecture re importance to I.C.I. of increasing use of computers.

2 typescript drafts, 4 pp. and 3 pp., n.d., c.1959-60.

C.7 Typescript notes for talk on 'Computer control', n.d., c.1964-65.

C.8 5 pp. undated ms. notes for speech in Mrs. Young's hand with some ms. corrections by Young, and an annotation on the first page 'Norway Paper'. These may be for the Christian Michelsen Annual Memorial Lecture, delivered by Young in Bergen, 1965, with the title 'Information Handling and Modern Society' (see C.1).

C.9 'The Thinking Behind ICI's Process Control Computers'.

4 pp. typescript of an article published in slightly revised form in Achievement, May 1965, under the title 'How ICI produce chemicals by computer'.

C.10, C.11 'The Management of Specialists'. Talk delivered at a weekend course for senior public health doctors on 'Management in a Health Department', Reading, September 1967.

C.10 Synopsis of the talk. Ms. and typescript drafts.

C.11 Brief correspondence and typescript report of the course.

C.12 8 pp. ms. notes for lecture re on-line computers. n.d. but internal evidence suggests that it was delivered at a conference in 1968. On the back of the first page are notes for a brief speech given at a post-conference dinner (presumably the same conference) in which the United Kingdom Automation Council and Control Division of the Institute of British Engineers are named as the organisers.

C.13, C.14 Speech delivered at a ceremony to mark the retirement in 1969 of Harold Edge, Instrument Manager of I.C.I. Agricultural Division. Edge collaborated with Young during the Second World War on the development of equipment for dispersing fog from R.A.F. runways (FIDO), and the speech contains reminiscences from this period.

Lectures, papers, publications, conferences

C.13 Ms. notes and drafts for speech. Folder includes a letter from Young, 15 September 1969, acknowledging the receipt of some notes on Edge's career, which is the only evidence for the date of the speech.

C.14 Photocopy of final draft of speech. 9 pp. ms.

Correspondence with Edge, 1953, 1969-70, is also included here.

C.15 2 pp. typescript draft entitled 'Instrumentation as a tool for productivity', n.d.

C.16 Part of a duplicate notebook, paginated 51-95, containing diagrams, notes and drafts for talks and lectures. Pp.61-89 contain draft of a lecture entitled 'The importance of a quantitative approach to the development of a chemical process', delivered to I.C.I. Heavy Organic Chemicals Division, n.d.

C.17 Typescript notes headed 'The Control Engineer', possibly for summing up at a conference, n.d.

C.18 3 pp. typescript headed (in Young's hand) 'Control, Dictaphone Belt. 1.11.72.'

Contains reflections on the social implications of the possibilities of control extended to human beings as well as chemical plants.

C.19-C.25 'The chemical and petrochemical industries'

The following items relate to a paper delivered by Young at a Royal Society Discussion meeting on 'Manufacturing Technology in the 1980's', 16 November 1972, and subsequently published in Phil. Trans. R. Soc. Lond. A, 1973.

C.19 Correspondence, mainly with G.B.R. Feilden and D.T.N. Williamson re arrangements for the Royal Society Discussion Meeting. Includes the official invitation to Young to read the paper.

C.20 Correspondence, mainly with colleagues in I.C.I., re background information for paper.

C.21 Memoranda from colleagues in response to Young's request for information and ideas. Ms. and typescript, some unsigned. Some of these are referred to in correspondence in C.20 above.

Lectures, papers, publications, conferences

C.22 Typescript notes, drafts and diagrams, probably all by Young, some with ms. corrections in his hand.

C.23 Ms. notes and diagrams in Young's hand.

C.24 Comments from colleagues on the draft of the paper as prepared for publication.

Requests for reprints of the paper are also included here.

C.25 Offprint of the published paper.

C.26 Several pages of ms. notes, mainly for talks, papers, etc. n.d.

C.27 Correspondence with publishers and others re publications by Young, 1949-68. The majority of the correspondence relates to Young's two books on Process Control and contains many appreciative comments on their usefulness for an understanding of the subject. In 1969 Young wrote:

'My "Introduction to Process Control System Design" was received with a degree of appreciation which was as surprising to me as it was pleasing. I am sure it was because many chemists and engineers, who were not versed in control, could understand what I had tried to say.

'This has encouraged me to proceed with the book I had originally planned to follow the "Introduction" to design: namely, "An Approach to the Design of Process Plant", or some title indicating that we have begun to use the basic approach advocated in the "Introduction".'

See A.32 for reviews of An Introduction to Process Control System Design.

C.28 Requests for Young to write articles, give talks, lectures, etc., 1964-71.

C.29 Correspondence re symposia and conferences attended by Young, or to which he was invited, 1951-76.

SECTION D CORRESPONDENCE (D.1 - D.27)

Most of the material consists of exchanges with colleagues, or former colleagues, at British or overseas Divisions of I.C.I. Some professional matters are discussed, such as research in progress, visits and exchanges, conferences and publications, and some personal news is exchanged.

There is also correspondence with other firms, consultants or individuals on research projects.

The material in D.1 - D.22 is presented alphabetically, with dates and a brief indication of content, and is indexed.

Folders D.23 - D.27 contain miscellaneous shorter correspondence; the content of each folder is indicated, but the material is not itemised or indexed.

D.1 Ajlouni, A. F. 1953-71
(I.C.I. Central Instrument Section c.1948-54)

Includes observations on developments in process control in the U.S.A., 1953, 1955, and some personal correspondence.

D.2 Andersen, J. A. 1966-73
(Director, Department of Applied Physics, Chr. Michelsen Institute, Bergen)

and Andersen, A. 1964

Personal and technical correspondence especially re Norwegian developments in process control research.

D.3 Battelle Institute, Geneva 1967, 1970

Correspondence re visits and research in progress. Includes observations by M. Jones on the future development of process control, 1970.

D.4 Brown, J. C. 1959-70
(I.C.I. 1934-73)

Mainly personal exchanges, letters of congratulation, etc.

D.5 Bush, S. F. 1972-77

Personal and professional correspondence, mainly re paper by Bush and Dyer communicated by Young for publication in Proc. Roy. Soc.; includes drafts, referees' comments and an offprint of the published version.

Includes correspondence with J.F. Davidson.

Correspondence

D.6	Clark, W. J. Personal and technical correspondence, mainly re slide rules.	1966-69
D.7	Clay, G. P. (I.C.I.) Re personal and company affairs.	1956-71
D.8	Cooke, J. F. Mainly personal and re Sir Harold Hartley Medal.	1953, 1971
D.9	Davies, D. S. (I.C.I. 1945-77) Mainly personal correspondence.	1965-73
D.10	Gretag Ltd. Re sequence controller, diagrams of which are enclosed.	1967
D.11	Gutzeit, J. Mainly re projects at Bonner & Moore Associates on automation, etc.	1967
D.12	Halsbury, J. A. H. G., Earl Halsbury Re future development of the Society of Instrument Technology.	1962
D.13	Hartley, Sir Harold Mainly personal correspondence, with some reminiscences and recollections.	1957-71
D.14	Iberall, A. S. Personal and technical correspondence.	1965-70
D.15	Keeley, T. C. Mainly personal, but some correspondence re recruitment for the Central Instrument Research Laboratory.	1967-71
D.16	Lunt, S. T. (I.C.I.) Re personal and I.C.I. affairs, including some exchanges on process control.	1958-70

Correspondence

D.17	Profos, P. Mainly personal. Includes correspondence with M. Jones, then at the Battelle Institute, Geneva (see also D.3).	1965-71
D.18	Rose, J. D. (I.C.I. 1935-72) Mainly personal correspondence.	1969-71
D.19	Rosenbrock, H. H. Re Sir Harold Hartley Medal.	1970-71
D.20	Smith, Sir Ewart Mainly personal, including correspondence re a visit to Bozedown by Sir Ewart Smith, June 1969.	1956-70
D.21	Swift, L. B. (Chairman, Taylor Instrument Companies) Personal and business correspondence.	1955-65
D.22	Tizard, R. H. Mainly personal correspondence.	1970
D.23-D.27	Miscellaneous shorter correspondence (not itemised or indexed)	
D.23	Letters from visitors (from I.C.I., other firms and individuals from Britain and overseas) to Young's laboratory. In date order.	1956-72
D.24	Correspondence re I.C.I. matters (and some personal correspondence).	
D.25	Letters exchanged with colleagues at I.C.I. on new appointments, promotions, retirement, etc.	
D.26	Miscellaneous requests for information on instrumentation and equipment, advice on publications, etc.	1966-67 (only)
D.27	References, appointments, advice on careers, etc.	

INDEX OF CORRESPONDENTS

No attempt has been made in this index to distinguish between postal correspondence and internal reports and memoranda exchanged by members of I.C.I.; a folder listed here may therefore contain all or any of these types of material, particularly if the reference is to Section B.

AIKMAN, A. Russell	B.40, B.41, B.42, B.43, D.1
AKERS, Sir Wallace Alan	D.8
ANDERSEN, Jan A.	D.2
ANDREW, S. M.	B.28, B.58, B.69, B.111, B.153, B.161
BAINBRIDGE, R. S.	B.61, B.62
BARNES, J. G. P.	B.100
BEECHING, Richard, Baron Beeching	A.41, B.69
BOWDEN, C. H.	B.10, B.18, B.19, B.28, B.55, B.57, B.61, B.62, B.63, B.65, B.66, B.68, B.69, B.112, B.117, B.148, B.156, B.158, B.159, B.161
BOX, M. J.	B.23, B.84
BRAHAM, J. E.	B.147, B.148, B.156, B.157
BREWIS, Rev. John Salusbury	A.6
BROWN, J. D.	B.38
BROWN, John Cecil	A.29, D.4
BUSH, Stephen F.	B.28, B.56, B.136, B.141, B.160, D.5
CALLARD, Sir Eric John (Sir Jack Callard)	B.158, B.160
CHENEVIX-TRENCH, T.	B.45, B.133
CLARK, W. Jasper	D.6
CLAY, Gabriel P.	D.7
COALES, John Flavell	A.13, D.8
COBB, A. J.	B.109, B.114
COLLINGE, H.	B.56, B.114

Index of Correspondents

DAVIDSON, John Frank — D.5

DAVIES, Duncan Sheppey — A.27, B.21, C.19, D.9

DAY, R. L. — B.22, B.55, B.59, B.60, B.61, B.63, B.67, B.106, B.137, B.138

DIBB, R. H. — B.14, B.116, B.150, B.159

DOBSON, Gordon Miller Bourne — A.12

EDGE, Harold — C.14

ELLIS, R. A. E. — B.10, B.70, B.71, B.76, B.130

EMDEN, Alfred Brotherston — A.6

EDWARDS, Edward George — A.18

FEILDEN, Geoffrey Bertram Robert — C.19

FOSTER, A. W. — A.17, B.61, B.62, B.68, B.113, B.141, B.157

GILLINGS, D. W. — B.28, B.62, B.74, B.119, B.120, B.121, B.123, B.124, B.125, B.126, B.127

GRAY, Ivor — B.58, B.98, B.100, B.101, B.102, B.104, B.105, B.107, B.109, B.110, B.111, B.113, B.114, B.116, B.139, B.140, B.141, B.152

GUTZON, John — D.11

HALSALL, J. R. — B.16, B.43, B.46, B.95, B.98, B.130, B.131, B.132

HALSBURY, John Anthony Hardinge Gifford, Earl Halsbury — D.12

HARTLEY, Sir Harold Brewer — A.19, A.20, A.22, D.13

HOLROYD, Sir Ronald — A.20

IBERALL, Arthur S. — D.14

JACKSON, Willis Baron Jackson of Burnley — A.13

JANSSEN, Jan M. L. — A.26

JONES, M. — B.56, B.80, D.3, D.17

KEELEY, Thomas Clews — A.6, D.15

LAW, W. M. — B.23, B.49, B.54, B.68, B.69, B.114

LAZAREV, Vladimir G. — B.135

LUNT, Samuel T. — B.28, B.50, B.53, B.57, B.69, B.73, B.113, B.114, B.119, B.156, B.157, B.161, D.16

Index of Correspondents

McMILLAN, J. B.44, B.48, B.49, B.50, B.51, B.52, B.56, B.64, B.75, B.111, B.113, B.141, B.147, B.156, B.158

MARTIN, Sir David Christie B.135, C.19

MASUBUCHI, Masmi A.24, A.40, B.49

MURRELL, A. P. C. B.95, B.98

MYLROI, Maurice G. A.18

NUTTING, David C. A.19

ORIEL, John Augustus A.16

PRICE, P. C. B.48, B.130

PROFOS, P. A.24, D.17

PUTT, C. K. B.23, B.138

RINTOUL, William A.14

ROBERTSON, H. H. B.80, B.118, B.157

ROSE, John Donald B.21, D.10, D.18

ROSENBROCK, Howard Harry D.19

RUTHERFORD, C. I. B.40, B.42

SAGE, M. W. B.98, B.106, B.112

SHEPHERD, F. B. B.55, B.57, B.59, B.60, B.107, B.132

SIMPSON, Oliver A.17

SMITH, Sir (Frank) Ewart B.156, D.20

SPINKS, Alfred A.41

SWIFT, Lewis B. D.21

TALLANTIRE, J. Donald B.35, B.156

THOMAS, G. E. B.81, B.83, B.88, B.111, B.113, B.119, B.159

THOMASON, J. G. B.28, B.55, B.62, B.69, B.114, B.119, B.152

THOMPSON, Charles Henry A.6

TIZARD, Richard H D.22

TOWNSEND, Sir John Sealy Edward A.6

Index of Correspondents

WARREN, J. B. B.59, B.62
WAUGH, Kenneth C. B.27, B.68
WEICKHARDT, L. W. A.14, A.22
WHITING, Douglas H. B.54, B.55, B.106, B.152, B.160
WILLIAMSON, David Theodore Nelson C.19