

THE ROYAL COMMISSION ON HISTORICAL MANUSCRIPTS

Report on further correspondence and papers of

ALAN MATHISON TURING

(1912-1954)

mathematician

deposited in

King's College Library, Cambridge

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(CSAC 104/1/85)

THE ROYAL COMMISSION ON HISTORICAL MANUSCRIPTS
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Supplementary catalogue of papers and correspondence of

ALAN MATHISON TURING FRS

(1912 - 1954)

Material additional to CSAC 53/7/77

Compiled by

Jeannine Alton and Peter Harper

Deposited in the Library of King's College, Cambridge

1985

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INTRODUCTION

PROVENANCE

The material has been assembled from several sources over the period 1977 - 84, as follows:

A.14 - A.33 and B.9, from the estate of Mrs. Sara Turing after her death in 1977;

C.24 - C.27 from N.E. Hoskin, received 1978;

C.23, D.6 - D.10, from Professor I. J. Good (photocopies from originals in his possession), received 1979;

D.11 - D.14 from Dr. A. Hodges, author of the biography Alan Turing: The Enigma, received 1983;

B.8 from Professor C.B. Jones, received 1984.

PRESENTATION

The material has been organised, numbered and sectionalised to follow the sequence of the catalogue compiled in 1977 (CSAC 53/7/77)

DESCRIPTION

The biographical and personal material in Section A was all received from the estate of Mrs. Turing and many items bear annotations or corrections by her. Several refer to the preparation and publication of her biography of her son, which was published by Heffer of Cambridge in 1959, and include biographical information and recollections.

The material on morphogenesis at C.24 - C.27 represents a substantial addition to the documentation of Turing's work and thinking on this topic, left uncompleted at his death. It has proved intractable so far to researchers. Hodges writes (p.494):

'He left behind a mass of detailed material, some organised into the form of a second paper, the rest in the form of worked examples and of computer print-outs incomprehensible to anyone else.'

Section D contains photocopied letters and calculations exchanged by Turing and I. J. Good (D.6 - D.10), and some original letters by Turing (D.11 - D.14), most of them addressed to P. Hall.

ACKNOWLEDGEMENTS

Thanks are due to all those who have made documents available, and to Andrew Hodges for permission to refer to and quote from his biography of Turing.

SECTION A BIOGRAPHICAL AND PERSONAL A.14 - A.33

- A.14 Obituaries and tributes to Turing: notice in Hazelhurst Gazette (2 copies, one corrected by Mrs. Turing); translation of sections about Turing's life and work made in 1967 from a Russian work The Beginning of Cybernetics, by A. Lerner; 'Caption under Alan's photo at N.P.L.'
- A.15-A.17 Letters received by Mrs. Turing on Turing's death, from colleagues, schoolmasters, neighbours and friends. Several refer to the circumstances of Turing's death, and to the inquest.
- 3 folders as follows:
- A.15 Andrews, A. J. P. (schoolmaster)
- Bates, J. A. V.
- Bullard, E. C.
- Clayton, L. (Turing's housekeeper)
- Coote, C. R. (Daily Telegraph)
- A.16 Darlington, S. (Hazelhurst school)
- Darlington, W. S. (Hazelhurst school)
- Greenbaum, F. M. (Turing's psychoanalyst)
- Jefferson, G. (Manchester University)
- A.17 Milner-White, E.
- Stopford, J. S. B.
- Webb, N. (Turing's neighbour)
- Unidentified (1p. only with much material, including the signature, deleted by Mrs. Turing)

Biographical and personal

- A.23 Miscellaneous later letters to Mrs. Turing about Turing.
- Clifford, G. D. 1969
- Jones, W. T. 1960
- Routledge, N. 1968
- Sutherland, N. S. 1968
-
- A.24 Miscellaneous material re the A.M. Turing Award, instituted by the Association of Computing Machinery (ACM) and first awarded in 1966. Includes printed information, a letter to Mrs. Turing about the Award (1974) and 5pp. ms. notes on the subject in the hand of Mrs. Turing, perhaps prepared for Sherborne School magazine.
-
- A.25 Shorter biographical items; includes photograph, and drawing inscribed by Mrs. Turing 'Alan at Barton House. Aged 6?'
-
- A.26-A.30 Letters to Turing, 1931-51.
- Mainly letters and telegrams of congratulation on various achievements, some including general information or reflections. In chronological order.
-
- A.26 1930 Award of scholarship to King's College, Cambridge (from Turing's grand-mother)
- 1931 Letter from G. O'Hanlon on Turing's leaving Sherborne and award of Goodman Scholarship (copy made by Mrs. Turing).
- 1935 Election to Fellowship, King's College.
-
- A.27 1936 Award of Smith's Prize, Cambridge.
-
- A.28-A.30 1951 Election as Fellow of the Royal Society.
-
- A.28 Bullard, E. C.
- Cooper, W. M.
- Darlington, W. S.
- Darwin, C. G.

Biographical and personal

- A.29 Goodwin, E. T.
 Jefferson, G.
 Lockspeiser, B.
 Mahler, K.
- A.30 Routledge, N.
 Thompson, R. S.
 Turing, S.
- A.31-A.33 Material relating to Mrs. Turing's biography.
- A.31 Notes and information on Turing family.
- A.32 Reviews of book.
- A.33 Correspondence re possible German edition, and proposed publication
 of 'Collected Works', 1971-72.

SECTION B PUBLICATIONS B.8, B.9

B.8 'Checking a large routine'

This was a paper given by Turing on 24 June 1949 at the inaugural conference of the EDSAC computer at the Mathematical Laboratory, Cambridge, and published in the Report of a Conference on High Speed Automatic Calculating Machines, pp.67-69. The paper as published contained several transcription errors, and a corrected version, with comments, was published by F.L. Morris and C.B. Jones in Annals of the History of Computing, 6, April 1984.

Folder includes photocopy of the 1949 paper and of the 1984 version under the title 'An Early Program Proof by Alan Turing', made available by courtesy of the authors.

B.9 'Computing machinery and intelligence'

Typescript copy of article published in MIND, LIX, October 1956. In Mrs. Turing's ring-backed binder with ms. title by her.

The paper is paginated 2-40 and also 146-184. There is a footnote added between pp.159 and 160 with a ms. note in Turing's hand.

SECTION C UNPUBLISHED MANUSCRIPTS AND DRAFTS C.23 - C.27

C.23 'Two contour-integral proofs', 'Ingham's proof', 'Another proof'

Ms. notes and calculations by Turing.

These are photocopies, paginated 3 and 4, of papers made available from his own archives by I.J. Good; p.3 has a ms. note by Good 'A note by Turing for I.J. Good, c.1943' and p.4 is addressed to him at 'Hut 11' (at Bletchley Park).

C.24-C.27 Work on morphogenesis.

Folders of notes, calculations and diagrams, received from N.E. Hoskin in 1978 and additional to the material on the subject listed as C.7-C.10 on p.15 of the handlist compiled in 1977. The papers are part of the extensive notes and drafts left at Turing's death which some of his colleagues (R.O. Gandy, N.E. Hoskin, B. Richards) intended to prepare for publication.

The material is entirely Turing's autograph manuscript and typescript, with many additions and corrections; it includes diagrams, tables, calculations and computer routines. Sometimes both sides of the paper are used; many pages have other work on the verso. Some of the material constitutes relatively substantial paginated sequences; some consists of random pages which could not be assigned a definite place or description by Turing's collaborators and colleagues.

All titles and descriptions in inverted commas are those which appear on the manuscripts. Later notes or comments in the hands of Hoskin and Gandy are identified and indicated wherever possible.

C.24 Folder inscribed 'Morphogens. Turing I'

With a ms. note by Gandy: 'This contains consecutive pieces which were not incorporated by Hoskin and Richards in their paper'.

Includes:

'Outline of development of the Daisy'
12pp. numbered by Gandy

13pp. sequence, unnumbered, with a ms. note 'Does this continue on? N.H.' [Hoskin].

8pp. sequence, unnumbered.

9pp. sequence, unnumbered, beginning 'Effect of quadratic terms'.

Substantial set of drafts and calculations, with Turing's separate page heading 'STABILITY AND APPROXIMATIONS'
27pp., unnumbered.

Unpublished notes and drafts

C.25 Folder inscribed 'Morphogen. Theory of Phyllotaxis. Turing 2'

With a ms. note by Gandy: 'This is the draft from which Hoskin and Richards prepared their paper Part I (which follows the draft rather closely. Passages in light blue are I think by Hoskin)'

Includes:

72pp. draft, numbered in another hand.

The draft is Turing's typescript, with many ms. revisions in his hand, usually in black ink but occasionally in pencil. Other corrections and markings appear in another hand, in blue ink and pencil, and there is also some linking material on separately numbered pages, e.g. 26a, 57a.

2pp. unnumbered ms. headed 'Stability of 2nd. order equations'.

Diagrams of florets in flower head, numbered and annotated by Turing.

Photograph of flower head.

Ms. heading for a plate (in another hand).

C.26 Folder inscribed 'Chemical Theory of Morphogenesis. Turing 3'

With a ms. note by Gandy: 'Part II of draft used by Hoskin and Richards'.

Includes:

22pp. draft, numbered in another hand.

The draft is Turing's typescript, with many revisions in his hand, in black ink.

The title 'Part II Chemical Theory of Morphogenesis' on p.1, and other corrections, revisions and linking material, appear passim in another hand, in blue-black ink.

2pp. draft for '4. "Noise" effects', with a ms. note by Hoskin: 'Another § 4 but should be included here even though incomplete. N.H.'

Ms. draft, pages numbered 19-28 in another hand, beginning: 'Effects of random disturbances', with ms. corrections by Turing (in black ink) and another (in blue ink).

Unpublished notes and drafts

C.27 Folder inscribed 'Turing 4'.

With a ms. note by Gandy: 'It will be difficult, in some places impossible, to know exactly what these fragments are (exactly) about.'

Inside the folder is a note by Hoskin: 'I have not been able to fit in any of the following notes in the main articles. In many cases there are other notes, presumably superseded, on the reverse of these pages. Some of these are not sequential.'

Many of these drafts are on the verso of programme sheets for Manchester University Computing Machine Laboratory, and some carry routines related to the themes of the mss. and perhaps intended to test them.

The material is in the form of bundles clipped together, some with Turing's heading or description, and have been left as received.

Includes:

'FIRCONES. Paper Theory'

14pp. drafts, notes, calculations.

3pp. notes and calculations, with computer routine 'OUTERFIR', perhaps related to above, and 1p. notes for modification of OUTERFIR program.

'KJELL Theory'

7pp. drafts, notes and calculations, p.7 contains a 'family tree' of computer routines related to the work, several of which appear in the various bundles of notes in this folder.

'KJELL PREP TRACK PAIRS'

22pp. drafts, notes and calculations, in ink and pencil, with many revisions and corrections; some pages used on both sides, and some top and bottom.

'Diagrams etc.'

10pp. notes, diagrams and calculations, including computer routines, 3pp. draft on 'golden lattice', 1p. table of flower species used by Turing for work on morphogenesis.

7pp. untitled notes, calculations, diagrams.

17pp. untitled notes, calculations and diagrams, many on lattices.

Continued

Unpublished notes and drafts

C.27 (Cont'd.) 5pp. notes, signed B.R. [Bernard Richards] on 'Morphogenesis of Cellular Structure'.

'Evidence relating to the diffusion reaction theory of morphogenesis'.

18pp. +1p. references. Typescript of paper by C.W. Wardlaw, with ms. note at head 'Rough draft. A.M. Turing'.

1p. ms. note by Turing.

SECTION D CORRESPONDENCE D.6 - D.14

- D.6-D.10 Letters and material exchanged with I.J. Good, and later correspondence of Good with Mrs. Turing, 1946-58. Photocopied material made available by Good from his own archives (see also C.23). Turing signs his letter 'Prof' and is so addressed by Good.
- D.6 Letter from Turing to Good commenting on the manuscript of Good's Probability and the Weighing of Evidence (published 1950). October 1946.
- D.7 Correspondence on the number of neurons in the brain, 25, 28, 31 July, 16, 18 September 1948. The September letters also refer to chess-playing machines.
- D.8 Letter from Good to Turing, with a ms. note 'Turing did not answer this letter', October 1948.
- Brief exchange re publication of paper by Good on population frequencies (Biometrika, 40, 1953), February 1953.
- D.9 Letters exchanged with Mrs. Turing in reply to her request for information and recollections about Turing; with various reminiscences, including references to Turing's buried silver. November-December 1956.
- D.10 Later correspondence with Mrs. Turing, mainly on the writing and publication of her biography, 1957-58.
- D.11-D.13 Letters from Turing to P. Hall.
- These are all autograph manuscript letters, made available by A. Hodges who used them in whole or in part in his biography Alan Turing: the Enigma. Page references are given in brackets. Philip Hall FRS (d.1982) was Turing's tutor at King's and became a lifelong friend.
- D.11 1935 4 April, 30 May. Letter of 4 April refers to a 'small-scale discovery' by Turing (published as 'Equivalence of left and right hand almost periodicity', J. Lond. Math. Soc., 10) (Hodges p.94).

Correspondence

D.12	1936	22 November	(Hodges, p.123)
	1937	4 April	(Hodges, p.130)
	1938	30 March	(Hodges, p.144)
		26 April	(Hodges, p.145)
		n.d.	(Hodges, p.146)

All addressed from Princeton.

D.13	n.d. [1951]	(Hodges, p.440)
	n.d., postmarked 17 April 1952	(Hodges, p.473)
D.14	Letter to P.H.F. Mermagen (contemporary at Sherborne, d.1985), n.d. c.1947 (Hodges, pp.362-3).	

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