

# Interdisciplinary Research Cultures in Mid-20th Century British Science: The Working Worlds of AI Pioneer Donald Michie (1923-2007)



WRoCAH funded Collaborative Doctoral Award between School of Philosophy, Religion and History of Science, University of Leeds and the British Library

## Lead Academic and Partner Organisation Supervisors

Prof Gregory Radick

School of Philosophy, Religion and History  
of Science

University of Leeds

Jonathan Pledge

Lead Curator

British Library

 UNIVERSITY OF LEEDS



## Project summary

Donald Michie – code-breaker, geneticist, computer scientist, Communist – was one of the founding figures in Britain of arguably the most transformative science of recent times: artificial intelligence (AI). Drawing on little-studied archival materials at the British Library (including still-unexamined born-digital material) as well as on oral-history interviews that the student will conduct, this project will use the twin careers of Michie and artificial intelligence to explore the connections between academia, industry and politics which made mid-20th century Britain a hospitable setting for this extraordinary new "interdiscipline."

## PhD Project description

The project is a historical inquiry into the making of artificial intelligence, tracked via the career of one of its major founders, Donald Michie (1923-2007). After codebreaking at Bletchley Park, then a decade or so as a brilliant geneticist inspired by Soviet work on the environmental adaptation of organisms, Michie began exploring what seemed like an instructive parallel: learning by machines. Famous for building a machine that learned to play a perfect game of noughts and crosses, Michie went on to direct the Department of Machine Learning and Perception at Edinburgh University. Michie's archive offers rich

resources for an interpretation of post-war British scientific culture's openness to the creation of artificial intelligence as a new interdisciplinary science, while Agar's "working worlds" framework (2012) – emphasizing the directive role of industrial and military needs in twentieth-century science – will enable the project to address wider issues.

The archive of Donald Michie consists of three tranches of material – approximately 1000 files – acquired between 2004 and 2008 with further born-digital (electronic) material, including emails, acquired in 2022. The archive primarily concerns Michie's career as a computer scientist and pioneer in the field of artificial intelligence and contains correspondence, notebooks and notes, publications, offprints, and photographs, as well as born-digital files. This project will produce the first systematic examination of Michie's career from the perspective of scholarly history of science. In making use of a range of archival sources and interpreting them in the light of the professional historiography, the project will contribute original information and insights of potential interest to historians, scientists, and policy-makers. The materials are so extensive and diverse that the student will be able to put their own stamp on the project by concentrating on particular themes in line with their interests and background, guided by the project supervisors.

Through participating in this collaborative project, the student will benefit from both the British Library's world-class, employability-enhancing support for professional development, and the specialist training in history of science provided by the Leeds Centre for History and Philosophy of Science. Experience of directly working with the archive and of disseminating the project's findings to diverse audiences will enhance the student's future employability.

### Research Questions

- What does an archivally informed reconstruction of Michie's career reveal about the nature, motives and preconditions for his disciplinary roaming and creativity?
- What were the conditions - intellectual, institutional, technical, economic, etc. - in post-war Britain that permitted the emergence of artificial intelligence, with the maverick Michie as one of its leaders?
- In what ways does Agar's "working worlds" framework illuminate the case of artificial intelligence in Britain, and in what ways should that case prompt modifications of the framework?

### Objectives and methods

- The use of archival sources will allow the student to analyse the ways in which material privately circulated but not retained in the public record contributes to the development of a working scientific culture.
- The student will work together with the British Library's Digital Preservation section to survey the as-yet unstudied born-digital element of Michie's archive, with a view towards

adding these materials to the existing catalogue. Alongside this, the student will work to enrich descriptive metadata in the existing Michie catalogue entries.

- The archive contains correspondence with scientists who are still alive. By conducting oral history interviews with members of Michie's teams and his students, to be deposited with the British Library, the student will record a first-hand portrayal of how Britain's artificial intelligence community formed around – and was guided by – Michie.

### **About the British Library**

The British Library is the national library of the United Kingdom and is one of the largest research libraries in the world, welcoming over 1.6 million visitors every year. Its collections include items in many languages and formats, both print and digital. As set out in the strategy document "Living Knowledge for Everyone," supporting UK research and creating public engagement opportunities are key elements of the British Library's priorities. The studentship will support the organisation by advancing both of these objectives

BL curators will initially provide the student with a detailed and contextual overview of the materials to be investigated. A deeper understanding of Michie's career and role in the establishment of the study of artificial intelligence will enhance understanding of how the culture of scientific research has developed in post-war Britain. Further, Michie's ability to draw upon multiple scientific disciplines to develop the field sheds light on the value of interdisciplinary collaboration.

Through the impact activities detailed below – including adding descriptive metadata to the existing catalogue, investigating born-digital materials (including emails), recording oral histories, writing blog posts and a peer-reviewed article, and contributing to an exhibition – the student will work with expert curators across the British Library's divisions to disseminate this knowledge. This will enable the Library to engage with and inspire new audiences as well as other researchers.

### **Engagement, outreach, dissemination and impact initiatives**

The student will engage in a number of activities to better develop their understanding of Michie and to communicate this understanding to a wider audience. These include:

- Extending previous efforts to catalogue archival material on Michie by both enriching descriptive metadata in the existing Michie catalogues and developing access to Michie's born-digital papers and correspondence.
- Undertaking oral history training and producing a minimum of five oral history recordings with Michie's peers and students, with the expectation that they would be added to the Library's oral history holdings as part of the Oral History of British Science collection.

- Assisting the Library in developing two public events through offering research aid. The first event will be a major Library exhibition on computers and computing. The second will be an evening event focused on Michie, delivered as part of the ongoing British Library events programme.
- Producing two blog posts per year for the British Library's Science and Untold Lives blog, and additional web content as opportunity permits (for example, for the Science section on the British Library Treasures website).
- Writing at least one 6-8,000 word paper, published in the peer reviewed Electronic British Library Journal.

The studentship can draw upon the outreach expertise developed in a previous collaboration by the supervisors on John Maynard Smith, which extended to performances by an associate theatre company, a podcast and a multi-month exhibition.

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### Financial support

Studentships for doctoral research are 40 months in duration for full-time study. Awards are subject to satisfactory academic progress. Awards must be taken up in October 2023; no deferrals are possible. Awards will comprise fees at Research Council rates and a maintenance grant (£17,668 in 2022/23). The grant pays the fees at the Home/UK rate; international students are, however, eligible to apply for this Studentship and the difference between the Home/UK and International fee will be met by the University of Leeds for a successful international applicant. Awards may be taken up on a part-time basis if a student is eligible to undertake part-time study; international applicants may be required to study full-time by the terms of their visa.

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### Qualifications

Strong applicants will have a good first degree in an appropriate subject, as well as a Master's degree (or be working towards one) and professional experience relevant to the scope of the project.

### Requirements of the Studentship

WRoCAH students are required to undertake a bespoke training package and to complete a Researcher Employability Project of at least a month, a Knowledge Exchange Project, and to engage with Internationalisation.

**All WRoCAH students must submit their thesis for examination with the funded period.** This is a requirement of the Arts & Humanities Research Council, which provides the funding for WRoCAH, and is a condition of accepting a Studentship.

Before applying for any WRoCAH Studentship, please first ensure that you have read the WRoCAH webpages about the WRoCAH training programme and requirements, as well as other funding opportunities

<http://wrocah.ac.uk/>

### How to apply

By 5pm Wednesday 8 March 2023, applicants are required to submit to WRoCAH an Expression of Interest, which should include:

1. A CV with details of academic qualifications
2. A covering letter comprising a two-page statement to convey your motivation and enthusiasm for the project, and to demonstrate your suitability for your intended PhD studies with the University and Project Partner.

*The covering letter should specifically highlight the following:*

- Your interest in the project and details on why you have chosen that University and Project Partner.
- How you will apply your current skills, knowledge and experience to undertake a PhD and the approach you would take to develop the project.
- How the project fits into your career plans and ambitions.

Expressions of Interest must be [submitted via this form](#).

- **17 March 2023: decision on short-listing**

The short-list of candidates to be invited for an interview will be announced on Wednesday 17 March 2023. *Short-listed candidates must complete a PhD programme application before interview.* If you are short-listed for an interview you will be sent details of how to apply for a place at the University of Leeds. At that point you will need to submit the names and contact details of two referees, copies of transcripts of your academic qualifications and (if applicable) an IELTS certificate.

- **w/c 17 April 2023: interviews**

Interviews will involve the academic supervisor, Project Partner supervisor and a member of the WRoCAH Studentships Committee. They will be conducted online.

**For more information about this project contact**

Prof Gregory Radick (G.M.Radick@leeds.ac.uk)

Jonathan Pledge (Jonathan.Pledge@bl.uk)