Meltzer
& Michie

Machine Intelligence 5

Edinburgh

MACHINE INTELLIGENCE 5

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with a previously unpublished report by
A. M. TURING [1912–1954]

EDINBURGH at the University Press

© 1969 Edinburgh University Press
22 George Square, Edinburgh

Printed in Great Britain at
The Aberdeen University Press

85224 176 3

Library of Congress
Catalog Card Number
67-13648

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INTRODUCTION

The aim of the Annual Machine Intelligence Workshop is to bring into a single compass separate schools of work which have something in common: that something is the potentiality for introducing attributes of intelligence into computing systems. We have this year the opportunity of prefacing the published proceedings with a document of unusual historical interest, which was written by A. M. Turing – but never published – at the moment when the first stored-program digital machines were becoming operational. His analyses and forecasts, made in 1947, can here be read and compared with what has actually occurred since then.

The fact that less than a quarter of a century has since elapsed indicates an impressive tempo of development, which is quickening rather than slackening. The effects on our society are likely to be profound, and it can be argued that the practitioners themselves should now attempt to acquire some understanding of the impact of the nascent new technology which they are introducing into our lives. This was the theme of a thoughtful lunch-time address delivered to the Workshop by Dr Jeremy Bray, MP, who was at that time Joint Parliamentary Secretary in the Ministry of Technology with special responsibility for computing. The closing session of the Workshop, which discussed the issues raised, resolved to invite in each subsequent year a paper, usually from outside the ranks of the profession, which should be concerned with social applications and implications of developments in artificial intelligence.

Once again we record our gratitude to the Science Research Council who met the main costs of holding the Workshop. We also owe thanks to the University of Edinburgh and to its Principal, Professor M. M. Swann FRS, for the provision of facilities for the participants and for acting as host to the Workshop lunch; to Mrs J. E. Hayes of the Department of Machine Intelligence and Perception for her help with the Workshop arrangements; and to Dr Helen Muirhead of the Edinburgh University Press for the precision and enthusiasm with which, once again, a high standard and speed of publication has been attained.

B. MELTZER
D. MICHIE
December 1969

PROLOGUE

Editors' note

The essay by Alan Turing, which we reproduce here, was written in September 1947, when the world's first stored-program digital computers, to a significant degree his own conceptual creation, were about to become operational. The paper was submitted in 1948 to the National Physical Laboratory, where Turing was then employed, as a report on his year's sabbatical leave which he had spent at Cambridge. During the same period Turing achieved his demonstration of the unsolvability of the word problem for semi-groups with cancellation.

We here record our thanks to Dr R. O. Gandy for making the typescript available, and to him and the North Holland Publishing Company for waiving certain restrictions of copyright. A condensed version is to appear in the *Collected Works of A.M.Turing* which is forthcoming under Dr Gandy's editorship. We also thank Mr Michael Woodger, who incidentally helped Turing finish it by drawing the original diagrams, for an unforgettable account of the furore created by Turing at N.P.L. with his prognostications of intelligent machinery: 'Turing is going to infest the countryside' some declared 'with a robot which will live on twigs and scrap iron!'

The anticipation of the notion of a sub-routine on page 21 and of the device of doing machine problem-solving *via* theorem-proving algorithms (p. 22) are striking examples of the prophetic insight which pervades the essay.