

## Alan M Turing

*Over the last decade, Europe and most advanced economies experienced a decline in productivity, leading to political unrest and rising uncertainty about the future. A new production revolution, enabled in part by artificial intelligence (AI), is now emerging, bringing a new wave of technologies, but there are widespread fears that these changes also will bring a big rise in unemployment as machines replace human beings in big numbers. History tells us that we should not be afraid of industrial change. AI will take over some tasks, but this will not happen all of a sudden and there will be plenty of work left for humans. Restricting or slowing down new technology will not help the world economy. Instead, nations need to help people adjust to more technically advanced jobs, while education should focus more on "21st century skills" such as teamwork and critical thinking. These are our next real challenges. This is the second essay in the Big Ideas series created by the European Investment Bank.*

*Containing never-before-published material, this fascinating account sheds new light on one of the greatest figures of the twentieth century.*

**A NEW YORK TIMES BESTSELLER** *The official book behind the Academy Award-winning film The Imitation Game, starring Benedict Cumberbatch and Keira Knightley* **It is only a slight exaggeration to say that the British mathematician Alan Turing (1912-1954) saved the Allies from the Nazis, invented the computer and artificial intelligence, and anticipated gay liberation by decades—all before his suicide at age forty-one. This New York Times–bestselling biography of the founder of computer science, with a new preface by the author that addresses Turing’s royal pardon in 2013, is the definitive account of an extraordinary mind and life. Capturing both the inner and outer drama of Turing’s life, Andrew Hodges tells how Turing’s revolutionary idea of 1936—the concept of a universal machine—laid the foundation for the modern computer and how Turing brought the idea to practical realization in 1945 with his electronic design. The book also tells how this work was directly related to Turing’s leading role in breaking the German Enigma ciphers during World War II, a scientific triumph that was critical to Allied victory in the Atlantic. At the same time, this is the tragic account of a man who, despite his wartime service, was eventually arrested, stripped of his security clearance, and forced to undergo a humiliating treatment program—all for trying to live honestly in a society that defined homosexuality as a crime. The inspiration for a major motion picture starring Benedict Cumberbatch and Keira Knightley, *Alan Turing: The Enigma* is a gripping story of mathematics, computers, cryptography, and homosexual persecution.**

***In a short life he accomplished much, and to the roll of great names in the history of his particular studies added his own. So is described one of the greatest figures of the twentieth century, yet Alan Turing’s name was not widely recognised until his contribution to the breaking of the German Enigma code became public in the 1970s. The story of Turing’s life fascinates and in the years since his suicide, Turing’s reputation has only grown, as his contributions to logic, mathematics, computing, artificial intelligence and computational biology have become better appreciated. To commemorate the centenary of Turing’s birth, this republication of his mother’s biography is enriched by a new foreword by Martin Davis and a never-before-published memoir by Alan’s older brother. The contrast between this memoir and the original biography reveals tensions and sheds new light on Turing’s relationship with his family, and on the man himself.***

**Centenary Edition**

**Martin Davis on Computability, Computational Logic, and Mathematical Foundations**

**A Life Story: Alan Turing**

**Turing Tales**

**Alan Turing’s Electronic Brain**

The highly successful series of graphic novels co-published with the Louvre museum in Paris (“Glacial Period”, “Museum Vaults”) continues with its next outstanding graphic novel. This time, the author invites us on a guided tour of the museum... by night... when the works of art come alive. Our guide: a deaf night watchman who somehow manages to communicate with the souls of those ethereal and timeless works of art. A visual tour de force with a strong edge of the frighteningly fantastic.

Alan Turing: code-breaker, mathematician, father of modern computing. Award-winning children’s author, Joanna Nadin, explores the extraordinary life of code-cracking genius, Alan Turing. A Life Story: This gripping series throws the reader directly into the lives of modern society’s most influential figures. With striking black-and-white illustrations along with timelines and never-heard-before facts. Also in the series: Katherine Johnson: A Life Story Stephen Hawking: A Life Story Rosalind Franklin: A Life Story

This book gives the most comprehensive, in depth and contemporary assessment of this classic topic in artificial intelligence. It is the first to elaborate in such detail the numerous conflicting points of view on many aspects of this multifaceted, controversial subject. It offers new insights into Turing’s own interpretation and is essential reading for research on the Turing test and for teaching undergraduate and graduate students in philosophy, computer science, and cognitive science.

Alan Turing Alan Turing had a radical and ingenious mind. He is considered one of the fathers of artificial intelligence, and his theories on this matter range from purely mechanical to almost spiritual. During World War II, his decryption of the Nazis’ Enigma codes proved vital for the Allied victory over the Axis powers. Turing’s fingerprints are everywhere, and yet his own country for quite some time failed to acknowledge it. It wasn’t until 2009 that the then prime minister of the United Kingdom, Gordon Brown, issued an official, posthumous apology to Alan Turing for “the appalling way he was treated.” To many, this was an admission that was far too long in coming. Inside you will read about... ? The Death of His First Love ? Turing Machines ? Breaking the Nazis’ Enigma Codes ? Conviction and Chemical Castration ? The Poison Apple And much more! As the chronicling of this book demonstrates, Alan Turing’s life was by no means easy; there were hardships, trials, and tribulations that would shake him to his core. But despite the tragic way his life ended by way of a poison apple, the spark ignited by Alan Turing’s short life is still something exceedingly brilliant to behold. Series Information: World War 2 Biographies Book 7

The Enigma Man

A.M. Turing’s ACE Report of 1946 and Other Papers

The Essential Turing

Alan Turing Decoded

Philosophical and Methodological Issues in the Quest for the Thinking Computer

The official book behind the Academy Award-winning film The Imitation Game, starring Benedict Cumberbatch and Keira Knightley Alan Turing was the mathematician whose cipher-cracking transformed the Second World War. Taken on by British Intelligence in 1938, as a shy young Cambridge don, he combined brilliant logic with a flair for engineering. In 1940 his machines were breaking the Enigma-enciphered messages of Nazi Germany’s air force. He then headed the penetration of the super-secure U-boat communications. But his vision went far beyond this achievement. Before the war he had invented the concept of the universal machine, and in 1945 he turned this into the first design for a digital computer. Turing’s far-sighted plans for the digital era forged ahead into a vision for Artificial Intelligence. However, in 1952 his homosexuality rendered him a criminal and he was subjected to humiliating treatment. In 1954, aged 41, Alan Turing took his own life.

Alan Turing, pioneer of computing and WWII codebreaker, is one of the most important and influential thinkers of the twentieth century. In this volume for the first time his key writings are made available to a broad, non-specialist readership. They make fascinating reading both in their own right and for their historic significance: contemporary computational theory, cognitive science, artificial intelligence and artificial life all spring from this ground-breaking work, which is also rich in philosophical and logical insight. An introduction by leading Turing expert Jack Copeland provides the background and guides the reader through the selection. About Alan Turing Alan Turing FRS OBE. (1912-1954) studied mathematics at King’s College, Cambridge. He was elected a Fellow of King’s in March 1935, at the age of only 22. In the same year he invented the abstract computing machines - now known simply as Turing machines - on which all subsequent stored-program digital computers are modelled. During 1936-1938 Turing continued his studies, now at Princeton University. He completed a PhD in mathematical logic, analysing the notion of ‘intuition’ in mathematics and introducing the idea of oracle computation, now fundamental in mathematical recursion theory. An ‘oracle’ is an abstract device able to solve mathematical problems too difficult for the universal Turing machine. In the summer of 1938 Turing returned to his Fellowship at King’s. When WWII started in 1939 he joined the wartime headquarters of the Government Code and Cypher School (GC&CS) at Bletchley Park, Buckinghamshire. Building on earlier work by Polish cryptanalysts, Turing contributed crucially to the design of electro-mechanical machines (‘bombs’) used to decipher Enigma, the code by means of which the German armed forces sought to protect their radio communications. Turing’s work on the version of Enigma used by the German navy was vital to the battle for supremacy in the North Atlantic. He also contributed to the attack on the cyphers known as ‘Fish’. Based on binary teleprinter code, Fish was used during the latter part of the war in preference to morse-based Enigma for the encryption of high-level signals, for example messages from Hitler and other members of the German High Command. It is estimated that the work of GC&CS shortened the war in Europe by at least two years. Turing received the Order of the British Empire for the part he played. In 1945, the war over, Turing was recruited to the National Physical Laboratory (NPL) in London. His brief to design and develop an electronic computer - a concrete form of the universal Turing machine. Turing’s report setting out his design for the Automatic Computing Engine (ACE) was the first relatively complete specification of an electronic stored-program general-purpose digital computer. Delays beyond Turing’s control resulted in NPL’s losing the race to build the world’s first working electronic stored-program digital computer - an honour that went to the Royal Society Computing Machine Laboratory at Manchester University, in June 1948. Discouraged by the delays at NPL, Turing took up the Deputy Directorship of the Royal Society Computing Machine Laboratory in that year. Turing was a founding father of modern cognitive science and a leading early exponent of the hypothesis that the human brain is in large part a digital computing machine, theorising that the cortex at birth is an ‘unorganised machine’ which through ‘training’ becomes organised ‘into a universal machine or something like it’. He also pioneered Artificial Intelligence. Turing spent the rest of his short career at Manchester University, being appointed to a specially created Readership in the Theory of Computing in May 1953. He was elected a Fellow of the Royal Society of London in March 1951 (a high honour).

Alan Turing was an extraordinary man who crammed into a life of only 42 years the careers of mathematician, codebreaker, computer scientist and biologist. He is widely regarded as a war hero grossly mistreated by his unappreciative country and it has become hard to disentangle the real man from the story. It is easy to cast him as a misfit, the stereotypical professor. But actually Alan Turing was never a professor, and his nickname ‘Prof’ was given by his codebreaking friends at Bletchley Park. Now, Alan Turing’s nephew, Dermot Turing, has taken a fresh look at the influences on Alan Turing’s life and creativity, and the later creation of a legend. For the first time it is possible to disclose the real character behind the cipher-text: how did Alan’s childhood experiences influence the man? Who were the influential figures in Alan’s formative years? How did his creative ideas evolve? Was he really a solitary, asocial genius? What was his wartime work after 1942, and why was it kept even more secret than the Enigma story? What is the truth about Alan Turing’s conviction for gross indecency, and did he commit suicide? What is the significance of the Royal Pardon granted in 2013? In Dermot’s own style he takes a vibrant and entertaining approach to the life and work of a true genius.

An exhaustive work that represents a landmark exploration of both the philosophical and methodological issues surrounding the search for true artificial intelligence. Distinguished psychologists, computer scientists, philosophers, and programmers from around the world debate weighty issues such as whether a self-conscious computer would create an internet ‘world mind’. This hugely important volume explores nothing less than the future of the human race itself.

Alan M. Turing, Second Edition

Alan M. Turing - más que un enigma

Alan Turing: His Work and Impact

Alan Turing: Life and Legacy of a Great Thinker

On the Odd Hours

Mathematical Logic is a collection of the works of one of the leading figures in 20th-century science. This collection of A.M. Turing’s works is intended to include all his mature scientific writing, including a substantial quantity of unpublished material. His work in pure mathematics and mathematical logic extended considerably further: the work of his last years, on originality and of permanent importance. This book is divided into three parts. The first part focuses on computability and ordinal logics and covers Turing’s work between 1937 and 1938. The second part covers type theory: it provides a general introduction to Turing’s work on type theory and covers his published and unpublished works between 1941 and 1948. Finally, the third part covers Turing’s work on the foundations of logic. Turing’s work on the foundations of logic extended considerably further: the work of his last years, on originality and of permanent importance. This book is divided into three parts. 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