



**JOHN VON NEUMANN**  
and **THE ORIGINS OF**  
**MODERN COMPUTING**  
WILLIAM ASPRAY

# John Von Neumann And The Origins Of Modern Computing

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## **John Von Neumann And The Origins Of Modern Computing:**

**John von Neumann and the Origins of Modern Computing** William Aspray, 1990-12-07 William Aspray provides the first broad and detailed account of von Neumann's many different contributions to computing. John von Neumann (1903-1957) was unquestionably one of the most brilliant scientists of the twentieth century. He made major contributions to quantum mechanics and mathematical physics and in 1943 began a new and all too short career in computer science. William Aspray provides the first broad and detailed account of von Neumann's many different contributions to computing. These Aspray reveals extended far beyond his well known work in the design and construction of computer systems to include important scientific applications, the revival of numerical analysis and the creation of a theory of computing. Aspray points out that from the beginning von Neumann took a wider and more theoretical view than other computer pioneers. In the now famous EDVAC report of 1945 von Neumann clearly stated the idea of a stored program that resides in the computer's memory along with the data it was to operate on. This stored program computer was described in terms of idealized neurons, highlighting the analogy between the digital computer and the human brain. Aspray describes von Neumann's development during the next decade and almost entirely alone of a theory of complicated information processing systems or automata and the introduction of themes such as learning, reliability of systems with unreliable components, self replication and the importance of memory and storage capacity in biological nervous systems. Many of these themes remain at the heart of current investigations in parallel or neurocomputing. Aspray allows the record to speak for itself. He unravels an intricate sequence of stories generated by von Neumann's work and brings into focus the interplay of personalities centered about von Neumann. He documents the complex interactions of science, the military and business and shows how progress in applied mathematics was intertwined with that in computers. William Aspray is Director of the Center for the History of Electrical Engineering at The Institute of Electrical and Electronics Engineers. [A History of Modern Computing, second edition](#) Paul E. Ceruzzi, 2003-04-08 From the first digital computer to the dot com crash, a story of individuals, institutions and the forces that led to a series of dramatic transformations. This engaging history covers modern computing from the development of the first electronic digital computer through the dot com crash. The author concentrates on five key moments of transition: the transformation of the computer in the late 1940s from a specialized scientific instrument to a commercial product; the emergence of small systems in the late 1960s; the beginning of personal computing in the 1970s; the spread of networking after 1985; and in a chapter written for this edition, the period 1995-2001. The new material focuses on the Microsoft antitrust suit, the rise and fall of the dot coms and the advent of open source software, particularly Linux. Within the chronological narrative, the book traces several overlapping threads: the evolution of the computer's internal design; the effect of economic trends and the Cold War; the long term role of IBM as a player and as a target for upstart entrepreneurs; the growth of software from a hidden element to a major character in the story of computing; and the recurring issue of the place of

information and computing in a democratic society The focus is on the United States though Europe and Japan enter the story at crucial points on computing per se rather than on applications such as artificial intelligence and on systems that were sold commercially and installed in quantities

**A New History of Modern Computing** Thomas Haigh, Paul E. Ceruzzi, 2021-09-14 How the computer became universal Over the past fifty years the computer has been transformed from a hulking scientific supertool and data processing workhorse remote from the experiences of ordinary people to a diverse family of devices that billions rely on to play games shop stream music and movies communicate and count their steps In A New History of Modern Computing Thomas Haigh and Paul Ceruzzi trace these changes A comprehensive reimagining of Ceruzzi's A History of Modern Computing this new volume uses each chapter to recount one such transformation describing how a particular community of users and producers remade the computer into something new Haigh and Ceruzzi ground their accounts of these computing revolutions in the longer and deeper history of computing technology They begin with the story of the 1945 ENIAC computer which introduced the vocabulary of programs and programming and proceed through email pocket calculators personal computers the World Wide Web videogames smart phones and our current world of computers everywhere in phones cars appliances watches and more Finally they consider the Tesla Model S as an object that simultaneously embodies many strands of computing

**Harmonies of Disorder** Leone Montagnini, 2017-08-19 This book presents the entire body of thought of Norbert Wiener 1894-1964 knowledge of which is essential if one wishes to understand and correctly interpret the age in which we live The focus is in particular on the philosophical and sociological aspects of Wiener's thought but these aspects are carefully framed within the context of his scientific journey Important biographical events including some that were previously unknown are also highlighted but while the book has a biographical structure it is not only a biography The book is divided into four chronological sections the first two of which explore Wiener's development as a philosopher and logician and his brilliant interwar career as a mathematician supported by his philosophical background The third section considers his research during World War II which drew upon his previous scientific work and reflections and led to the birth of cybernetics Finally the radical post-war shift in Wiener's intellectual path is considered examining how he came to abandon computer science projects and commenced ceaseless public reflections on the new sciences and technologies of information their social effects and the need for responsibility in science

**The Oxford Companion to United States History** Paul S. Boyer, 2001-07-04 Here is a volume that is as big and as varied as the nation it portrays With over 1,400 entries written by some 900 historians and other scholars it illuminates not only America's political diplomatic and military history but also social cultural and intellectual trends science technology and medicine the arts and religion Here are the familiar political heroes from George Washington and Benjamin Franklin to Abraham Lincoln Woodrow Wilson and Franklin D. Roosevelt But here too are scientists writers radicals sports figures and religious leaders with incisive portraits of such varied individuals as Thomas Edison and Eli Whitney Babe Ruth and Muhammed Ali Black Elk and Crazy Horse

Margaret Fuller Emma Goldman and Marian Anderson even Al Capone and Jesse James The Companion illuminates events that have shaped the nation the Great Awakening Bunker Hill Wounded Knee the Vietnam War major Supreme Court decisions Marbury v Madison Roe v Wade landmark legislation the Fugitive Slave Law the Pure Food and Drug Act social movements Suffrage Civil Rights influential books The Jungle Uncle Tom s Cabin ideologies conservatism liberalism Social Darwinism even natural disasters and iconic sites the Chicago Fire the Johnstown Flood Niagara Falls the Lincoln Memorial Here too is the nation s social and cultural history from Films Football and the 4 H Club to Immigration Courtship and Dating Marriage and Divorce and Death and Dying Extensive multi part entries cover such key topics as the Civil War Indian History and Culture Slavery and the Federal Government A new volume for a new century The Oxford Companion to United States History covers everything from Jamestown and the Puritans to the Human Genome Project and the Internet from Columbus to Clinton Written in clear graceful prose for researchers browsers and general readers alike this is the volume that addresses the totality of the American experience its triumphs and heroes as well as its tragedies and darker moments

*Using the Engineering Literature* Bonnie A. Osif, 2016-04-19 With the encroachment of the Internet into nearly all aspects of work and life it seems as though information is everywhere However there is information and then there is correct appropriate and timely information While we might love being able to turn to Wikipedia for encyclopedia like information or search Google for the thousands of links **Focus On: 100 Most Popular American Agnostics** Wikipedia contributors,

**Blindside** Francis Fukuyama, 2008-01-27 A host of catastrophes natural and otherwise as well as some pleasant surprises like the sudden end of the cold war without a shot being fired have caught governments and societies unprepared many times in recent decades September 11 is only the most obvious recent example among many unforeseen events that have changed even redefined our lives We have every reason to expect more such events in future Several kinds of unanticipated scenarios particularly those of low probability and high impact have the potential to escalate into systemic crises Even positive surprises can be major policy challenges Anticipating and managing low probability events is a critically important challenge to contemporary policymakers who increasingly recognize that they lack the analytical tools to do so Developing such tools is the focus of this insightful and perceptive volume edited by renowned author Francis Fukuyama and sponsored by The American Interest magazine *Blindside* is organized into four main sections Thinking about Strategic Surprise addresses the psychological and institutional obstacles that prevent leaders from planning for low probability tragedies and allocating the necessary resources to deal with them The following two sections pinpoint the failures institutional as well as personal that allowed key historical events to take leaders by surprise and examine the philosophies and methodologies of forecasting In Pollyana vs Cassandra for example James Kurth and Gregg Easterbrook debate the future state of the world going forward Mitchell Waldrop explores why technology forecasting is so poor and why that is likely to remain the case In the book s final section What Could Be internationally renowned authorities discuss low probability high impact

contingencies in their area of expertise For example Scott Barrett looks at emerging infectious diseases while Gal Luft and Anne Korin discuss energy security How can we avoid

**A to Z of Computer Scientists, Updated Edition** Harry Henderson,2020-01-01 Praise for the previous edition Entries are written with enough clarity and simplicity to appeal to general audiences The additional readings that end each profile give excellent pointers for more detailed information Recommended Choice This well written collection of biographies of the most important contributors to the computer world is a valuable resource for those interested in the men and women who were instrumental in making the world we live in today This is a recommended purchase for reference collections American Reference Books Annual this one is recommended for high school public and undergraduate libraries Booklist The significant role that the computer plays in the business world schools and homes speaks to the impact it has on our daily lives While many people are familiar with the Internet online shopping and basic computer technology the scientists who pioneered this digital age are generally less well known A to Z of Computer Scientists Updated Edition features 136 computer pioneers and shows the ways in which these individuals developed their ideas overcame technical and institutional challenges collaborated with colleagues and created products or institutions of lasting importance The cutting edge contemporary entries explore a diverse group of inventors scientists entrepreneurs and visionaries in the computer science field People covered include Grace Hopper 1906 1992 Dennis Ritchie 1941 2011 Brian Kernighan 1942 present Howard Rheingold 1947 present Bjarne Stroustrup 1950 present Esther Dyson 1951 present Silvio Micali 1954 present Jeff Bezos 1964 present Pierre Omidyar 1967 present Jerry Yang 1968 present

**Reader's Guide to the History of Science** Arne Hessenbruch,2013-12-16 The Reader s Guide to the History of Science looks at the literature of science in some 550 entries on individuals Einstein institutions and disciplines Mathematics general themes Romantic Science and central concepts Paradigm and Fact The history of science is construed widely to include the history of medicine and technology as is reflected in the range of disciplines from which the international team of 200 contributors are drawn

**The Polymath** Peter Burke,2020-09-08 The first history of the western polymath from the fifteenth century to the present day From Leonardo Da Vinci to John Dee and Comenius from George Eliot to Oliver Sacks and Susan Sontag polymaths have moved the frontiers of knowledge in countless ways But history can be unkind to scholars with such encyclopaedic interests All too often these individuals are remembered for just one part of their valuable achievements In this engaging erudite account renowned cultural historian Peter Burke argues for a more rounded view Identifying 500 western polymaths Burke explores their wide ranging successes and shows how their rise matched a rapid growth of knowledge in the age of the invention of printing the discovery of the New World and the Scientific Revolution It is only more recently that the further acceleration of knowledge has led to increased specialisation and to an environment that is less supportive of wide ranging scholars and scientists Spanning the Renaissance to the present day Burke changes our understanding of this remarkable intellectual species

The First Computers Raul Rojas,Ulf Hashagen,2002-07-26 This

history of computing focuses not on chronology what came first and who deserves credit for it but on the actual architectures of the first machines that made electronic computing a practical reality The book covers computers built in the United States Germany England and Japan It makes clear that similar concepts were often pursued simultaneously and that the early researchers explored many architectures beyond the von Neumann architecture that eventually became canonical The contributors include not only historians but also engineers and computer pioneers An introductory chapter describes the elements of computer architecture and explains why being first is even less interesting for computers than for other areas of technology The essays contain a remarkable amount of new material even on well known machines and several describe reconstructions of the historic machines These investigations are of more than simply historical interest for architectures designed to solve specific problems in the past may suggest new approaches to similar problems in today s machines

Contributors Titiimaea F Ala ilima Lin Ping Ang William Aspray Friedrich L Bauer Andreas Brennecke Chris P Burton Martin Campbell Kelly Paul Ceruzzi I Bernard Cohen John Gustafson Wilhelm Hopmann Harry D Huskey Friedrich W Kistermann Thomas Lange Michael S Mahoney R B E Napper Seiichi Okoma Hartmut Petzold Ra l Rojas Anthony E Sale Robert W Seidel Ambros P Speiser Frank H Sumner James F Tau Jan Van der Spiegel Eiti Wada Michael R Williams Modern Mathematics, Updated Edition Michael Bradley,2019-11-01 Praise for the previous edition ample information for reports School Library Journal During the first half of the 20th century mathematics became an international discipline that led to major advances in science and technology Modern Mathematics Updated Edition provides an eye opening introduction to those five historic decades by analyzing the advancement of the field through the accomplishments of 10 significant mathematicians From David Hilbert and Emmy Noether who introduced the infinite dimensional vector spaces and algebraic rings that bear their names to Norbert Wiener the founder of cybernetics this in depth title covers the early 20th century advancements that expanded the field of mathematics and transformed the way that mathematicians do their work This edition is ideal for middle and high school students seeking resources for research or general interest Historical Dictionary of the 1940s James Gilbert Ryan,Leonard C. Schlup,2006 Contains entries for individuals institutions and events focusing mostly on the U S Entries cover topics in science history literature theater and entertainment and many other areas **The Oxford Companion to the History of Modern Science** John L. Heilbron,2003-02-14 Containing 609 encyclopedic articles written by more than 200 prominent scholars The Oxford Companion to the History of Modern Science presents an unparalleled history of the field invaluable to anyone with an interest in the technology ideas discoveries and learned institutions that have shaped our world over the past five centuries Focusing on the period from the Renaissance to the early twenty first century the articles cover all disciplines Biology Alchemy Behaviorism historical periods the Scientific Revolution World War II the Cold War concepts Hypothesis Space and Time Ether and methodologies and philosophies Observation and Experiment Darwinism Coverage is international tracing the spread of science from its traditional centers and explaining how the

prevailing knowledge of non Western societies has modified or contributed to the dominant global science as it is currently understood Revealing the interplay between science and the wider culture the Companion includes entries on topics such as minority groups art religion and science s practical applications One hundred biographies of the most iconic historic figures chosen for their contributions to science and the interest of their lives are also included Above all The Oxford Companion to the History of Modern Science is a companion to world history modern in coverage generous in breadth and cosmopolitan in scope The volume s utility is enhanced by a thematic outline of the entire contents a thorough system of cross referencing and a detailed index that enables the reader to follow a specific line of inquiry along various threads from multiple starting points Each essay has numerous suggestions for further reading all of which favor literature that is accessible to the general reader and a bibliographical essay provides a general overview of the scholarship in the field Lastly as a contribution to the visual appeal of the Companion over 100 black and white illustrations and an eight page color section capture the eye and spark the imagination

**Computer History** Vijay Kumar Yadav , Computer History is an insightful exploration of the evolution of computing from ancient counting devices to modern technological marvels This comprehensive guide delves into the pivotal moments and key figures that shaped the world of computing Discover the origins of mechanical computation with the abacus and the Antikythera Mechanism and follow the transformative innovations of pioneers like Charles Babbage Ada Lovelace and Alan Turing The book also examines the rise of electronic computers the personal computer revolution and the development of groundbreaking software and operating systems Additionally it highlights the impact of the internet modern computing trends and the future directions in quantum and neuromorphic computing Addressing ethical and societal implications this book offers a complete historical overview for enthusiasts students and professionals alike providing a deeper understanding of the technology that underpins our digital age

*Ubiquitous Computing, Complexity and Culture*  
Ulrik Ekman, Jay David Bolter, Lily Diaz, Morten Sondergaard, Maria Engberg, 2015-12-22 The ubiquitous nature of mobile and pervasive computing has begun to reshape and complicate our notions of space time and identity In this collection over thirty internationally recognized contributors reflect on ubiquitous computing s implications for the ways in which we interact with our environments experience time and develop identities individually and socially Interviews with working media artists lend further perspectives on these cultural transformations Drawing on cultural theory new media art studies human computer interaction theory and software studies this cutting edge book critically unpacks the complex ubiquity effects confronting us every day The companion website can be found here <http://ubiquity.dk>

*History of Shock Waves, Explosions and Impact*  
Peter O. K. Krehl, 2008-09-24 This unique and encyclopedic reference work describes the evolution of the physics of modern shock wave and detonation from the earlier and classical percussion The history of this complex process is first reviewed in a general survey Subsequently the subject is treated in more detail and the book is richly illustrated in the form of a picture gallery This book is ideal for everyone professionally interested in shock wave phenomena

ENIAC in Action Thomas

Haigh, Peter Mark Priestley, Crispin Rope, 2016-02-05 This work explores the conception design construction use and afterlife of ENIAC the first general purpose digital electronic computer

**Modern Mathematics** Facts On File, Incorporated, 2006

During the first half of the 20th century mathematics became an international discipline that led to major advances in science and technology Modern Mathematics 1900 to 1950 provides an eye opening introduction to those five historic decades by analyzing the advancement of the field through the accomplishments of 10 significant mathematicians From David Hilbert and Emmy Noether who introduced the infinite dimensional vector spaces and algebraic rings that bear their names to Norbert Wiener the founder of cybernetics this in depth volume is an excellent choice for libraries aiming to provide a range of resources covering the history of mathematics

John Von Neumann And The Origins Of Modern Computing: Bestsellers in 2023 The year 2023 has witnessed a remarkable surge in literary brilliance, with numerous captivating novels enthraling the hearts of readers worldwide. Lets delve into the realm of top-selling books, exploring the captivating narratives that have captivated audiences this year. The Must-Read :

Colleen Hoover "It Ends with Us" This heartfelt tale of love, loss, and resilience has captivated readers with its raw and emotional exploration of domestic abuse. Hoover expertly weaves a story of hope and healing, reminding us that even in the darkest of times, the human spirit can prevail.

John Von Neumann And The Origins Of Modern Computing : Taylor Jenkins Reids "The Seven Husbands of Evelyn Hugo" This spellbinding historical fiction novel unravels the life of Evelyn Hugo, a Hollywood icon who defies expectations and societal norms to pursue her dreams. Reids captivating storytelling and compelling characters transport readers to a bygone era, immersing them in a world of glamour, ambition, and self-discovery.

John Von Neumann And The Origins Of Modern Computing : Delia Owens "Where the Crawdads Sing" This mesmerizing coming-of-age story follows Kya Clark, a young woman who grows up alone in the marshes of North Carolina. Owens spins a tale of resilience, survival, and the transformative power of nature, entrancing readers with its evocative prose and mesmerizing setting. These top-selling novels represent just a fraction of the literary treasures that have emerged in 2023. Whether you seek tales of romance, adventure, or personal growth, the world of literature offers an abundance of engaging stories waiting to be discovered.

The novel begins with Richard Papen, a bright but troubled young man, arriving at Hampden College. Richard is immediately drawn to the group of students who call themselves the Classics Club. The club is led by Henry Winter, a brilliant and charismatic young man. Henry is obsessed with Greek mythology and philosophy, and he quickly draws Richard into his world. The other members of the Classics Club are equally as fascinating. Bunny Corcoran is a wealthy and spoiled young man who is always looking for a good time. Charles Tavis is a quiet and reserved young man who is deeply in love with Henry. Camilla Macaulay is a beautiful and intelligent young woman who is drawn to the power and danger of the Classics Club. The students are all deeply in love with Morrow, and they are willing to do anything to please him. Morrow is a complex and mysterious figure, and he seems to be manipulating the students for his own purposes. As the students become more involved with Morrow, they begin to commit increasingly dangerous acts.

The Secret History is a exceptional and suspenseful novel that will keep you speculating until the very end. The novel is a cautionary tale about the dangers of obsession and the power of evil.

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