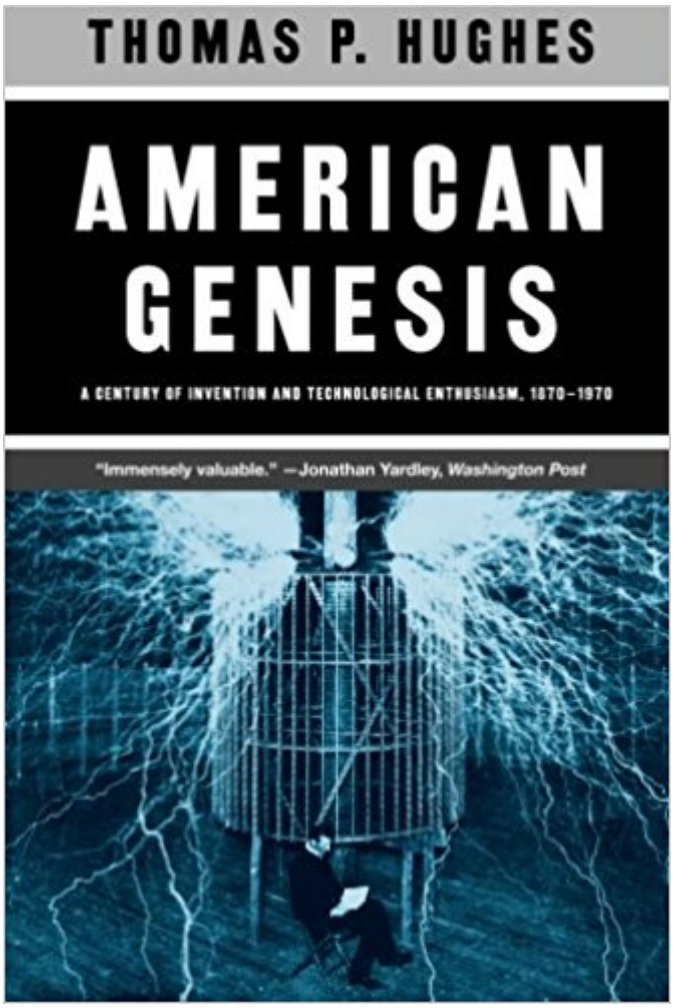
American Genesis: A Century Of Invention And Technological Enthusiasm, 1870-1970



Synopsis

The book that helped earn Thomas P. Hughes his reputation as one of the foremost historians of technology of our age and a finalist for the Pulitzer Prize in 1990, American Genesis tells the sweeping story of America’s technological revolution. Unlike other histories of technology, which focus on particular inventions like the light bulb or the automobile, American Genesis makes these inventions characters in a broad chronicle, both shaped by and shaping a culture. By weaving scientific and technological advancement into other cultural trends, Hughes demonstrates here the myriad ways in which the two are inexorably linked, and in a new preface, he recounts his earlier missteps in predicting the future of technology and follows its move into the information age.

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Customer Reviews

This potentially interesting yet turgidly written sociological study argues that the fertile era of technological innovation in America, which produced the electric light, the telephone, the automobile and the airplane, among other wonders, is better understood as a period of system building than of invention. A professor of the history and sociology of science at the University of Pennsylvania, Hughes begins by analyzing the careers of a dozen independent inventors, including Edison and the Wright Brothers as well as the less famous Lee De Forest and Edwin Armstrong (who vied for patents on the vacuum tube). He goes on to describe the gigantic systems their inventions generated, in the U.S., Europe and even the Soviet Union--the electric utilities, the gasoline-fueled automobile industry, broadcasting, aviation and the rest of the military-industrial complex. Hughes’s

extensive research has turned up a wealth of detail about the history of engineering and technology, but because he jumps back and forth between innovators and systems builders to work out his sociological theories (rather than choosing a few critical examples and then telling those stories in depth), the book seems destined more for sociologists than a general audience. Copyright 1989 Reed Business Information, Inc. --This text refers to an out of print or unavailable edition of this title.

This history of technology, covering a century of remarkable activity, starts off with the independent inventors--Edison, Bell, Sperry, and the Wrights. The author delves into their motivations and methods and sheds light on how they selected problems to be solved. The history then progresses to the larger, more complex innovations, including electrical power distribution systems and Ford's assembly plants. A fascinating section deals with the Soviet Union's exploitation of America's know-how, especially in scientific management, as developed by Frederick W. Taylor, Frank Gilbreth, and Henry Gantt. More recent and complicated systems approaches, as represented by the TVA program, the Manhattan Project, as well as other military and space programs, are also discussed. A final chapter surveys the disappointments with technology, as articulated by Lewis Mumford, Jacques Ellul, Henry Marcuse, and others. A well-rounded, if a bit plodding, survey of 100 truly monumental years.- Daniel LaRossa, Connetquot P.L., Bohemia, N.Y.Copyright 1989 Reed Business Information, Inc. --This text refers to an out of print or unavailable edition of this title.

Starting with a flurry of patents in the late nineteenth century, Hughes traces the history of technological development and its social impact. He begins with independent and dynamic inventor-entrepreneurs who applied a non-theoretical, trial-and-error approach to invention and who needed to appeal to sponsors for funding and implementation of their inventions. They were pragmatists who often used metaphors to try to understand and solve their problems (pp. 75-83 offers an excellent exposition of metaphor). They were eventually replaced by scientists working in cooperative settings, not often concerned with the practical uses of science and technology, but guided by curiosity and theoretical considerations. They were theoreticians who used mathematical symbols to find new avenues of research. This is one of the main tensions that runs through the book: practical inventors and engineers versus abstract-minded scientists.Ironically, it was the individual inventors, like Edison and Ford, who undermined their own way-of-life by implementing the rigid, hierarchical system that mitigated the role of individual creativity and initiative, swallowing both the inventor and the scientist. Samuel Insull, who had worked under Edison, built an elaborate and intertwined conglomeration of electrical utilities, and stimulated demand as a means to lower

electricity prices and justify massive integration - here we see the beginnings of the intimate relationship between consumerism and technological advancement. The system was further conceptualized and elaborated by Frederick Taylor’s scientific management ("the system must be first") and implemented in ever-increasing complexity until it culminated in the Manhattan project - the largest and most complicated system in history.Although the Eisenhower administration was the main impetus behind this project, the former president warned of the perils of the military-industrial-university complex. Further elaborated by Lewis Mumford and Herbert Marcuse, they criticized that such a "complex" would, as Marx had done so after the first Industrial Revolution, lead to the separation between man and his work. In such a pervasive system, man would be ruled and manipulated not by despots or the industrial class, but by indeterminate algorithms and processes, that would cut man off from himself, others, and nature.One of the surprising elements in the history is the crucial role that European, especially German, scientists, engineers and craftsman had in the American genesis. They were integral at every stage of development, from the first individual inventors who needed skilled tradesmen, to the engineers and scientists of Germany’s Chemical Revolution employed by the new R&D departments of American companies, up until the Manhattan Project which actively sought Nobel laureates Leo Szilard, Eugene Wigner and Enrico Fermi to steer the nuclear physics program. Especially in the arts, design and architecture, the Europeans reflected back to the Americans the ideals of the technological transformation - efficiency, speed, usefulness, purposefulness, and simplicity - as embodied in the Bauhaus, Futurist and Modernist movements.This book complements Hughes’ other book: Human-Built World. The former emphasizes the the narrative of change and its impact on society, while the latter discuses the philosophical underpinnings of American technological development as a means to build a Second creation, which is only alluded to in the former. They should be read in tandem to fully understand Hughes’ overarching theses.

Excellent book if you want to know about the history and progression of invention in America.

Thomas Hughes provides a critical look at how technology developed throughout the 20th century. The book begins in the 1870’s with the inventors workshop and people like Edison gathering machinists around to develop new technologies for profit. This type of work space was based upon proprietary knowledge and combing the skills of those present. It was not a business driven venture on a product but it focused on the business of innovation. From the centers of innovation corporations began to develop their own think tanks and research and development labs. Although

the book leaves out the early efforts of Du Pont it does pick up with AT&T and Bell Labs as the forbearers' of corporate research. The military became the other area for innovation as World War I and eventually 2 brought together science and research in a whole new way from the TVA to the Manhattan project. Also included in this new venture was mass production and the scientific management of Frederick Taylor that was employed at companies such as Bethlehem Steel and beyond. The book trails off in the 1970's with the countercultures efforts at rejecting Taylorism and starting into the PC revolution. This book provides an excellent synopsis of these doctrinal shifts in technological production and how they shaped America.

nice condition - thanks.

Arrived as described

The title indicates his thesis. "Americans," Hughes writes, "created the modern technological nation; this was the American genesis."(3) The problem he faces is this: Americans see "themselves primarily as democratic people dedicated to the doctrine of free enterprise" rather than, as he does, as builders.(1) Hughes' challenge therefore is to redirect the focus on Americans and their culture as inventors and systems builders. He makes a good case. Hughes articulates a chronology that logically follows the growth of systems. First he discusses the invention of systems, then the spread of large systems, and finally "the emergence of a technological culture, of mammoth government systems, and counterculture reactions to systems."(6-7)American inventiveness and technological enthusiasm characterize the period from 1870 until 1970. In its aftermath there remained a legacy, which Hughes labels as "the burden" of nuclear destruction, environmental concerns, and the wastefulness of wars (he specifically mentions the Vietnam War). Hughes hopes that "those who know the history and [understand] the burden may be able to rid themselves of it or turn it to their ends."(12) In his eyes history has a humanitarian message and he is the oracle. While his focus is on technology, his philosophy is humanistic. Government has a role, but people make the difference. This is how history is valuable. The American experience was unique and his purpose is to elevate people's understanding of their role; indeed, their responsibility.Beginning in 1870, about the time when Alexander Graham Bell invented the telephone in 1876, independent inventors were responsible for a "Gigantic Tidal Wave of Human Ingenuity."(13) The number of patents doubled and, between 1866 and 1896, the number issued to each person nearly doubled. Hughes feels existing historical accounts create an unfair image of inventors, as "one-dimensional heroes."(19)

To Hughes this is an inaccurate characterization and he proceeds to redefine them as the cornerstones of technological systems.To make his point he tries to uncover the source of inventor's creativity and motives. They relied on experimentation and their work was characterized by long hours of drudgery punctuated infrequently by "eureka moments."(20) The independent inventors acted on their own free will and followed their own inspirations. They "could not depend on science and abstract theory as guides into the future because they were exploring beyond the front edge of technology and knowledge."(48-49)Hughes tries to understand why independent inventors chose to solve the problems they did and how they went about solving them. He also tried to get into their heads. Based on their work his analysis disclosed two types of inventions. "The system-originating inventions can be labeled radical, the system-improving ones conservative."(53) Examples of the radical inventors are the Wright Brothers, the airplane; Lee De Forest and Reginald Fessenden, wireless communication; and Nikola Tesla, power transmission. More conservative professional inventor-entrepreneurs include Thomas Edison, Elmer Sperry, and Sir Hiram Stevens Maxim because of "their years of full-time dedication to invention and their establishment of companies to exploit their inventions."(67) This proves insightful and represents original thinking. It becomes a useful reference as Hughes proceeds to discuss the growth of systems.Furthermore, in delving into the inventor's minds, Hughes observes a unique thought process in problem solving. A "problem-identification technique that suggest[ed] the image, or metaphor, of a reverse salient in an expanding military front. ...A military front line has salients and reentrants (reverse salients) all along its length."(71)"The reverse salient in an advancing military front proves an apt metaphor for a technological system, because the system, like a military advance develops unevenly. Some components in a technological system, like some units in the military front, fall behind other. In the case of the military, ahead and behind can be determined by physical distance. Some components in technological systems can be said to be behind others, if the former function less efficiently and act as a drag on the system."(72)This is interesting. Hughes realizes he is using a metaphor which might be confusing to the reader so he proceeds with an explanation in order to make it work. It is an apt metaphor, he observes, because "`reverse salient' suggests the fluidity of the course of technological-system development; other metaphors suggesting rigidity and simplicity, such as `bottleneck,' do not work as well."(72-73)Metaphors must be used skillfully in order to be affective however they can be misleading. Hughes understands this. "[N]ot only poets, but schizophrenics...[can] make such metaphors."(76) There has to be some similarity or, rather than fostering clarity, just the opposite will occur. In explaining the metaphor Hughes not only educates the reader with a deeper understanding of the technological system, but of the military as well.

However this is an appropriate technique if used only sparingly. If each metaphor has to be accompanied by an explanation its usefulness as a literary device is negated.The "reverse salient" metaphor is important to Hughes as a continuing metaphor fundamental to his thesis. The advance of systems technology is not linear; there are advances and retreats along a wide front. This is evident when technological development shifted from independent inventors to a "system must be first"(184) approach that occurred when the radical attitude of system-originating inventions clashed with the conservative system-improving ones.A case in point is the experience of inventor-entrepreneur Edwin Armstrong and his investigation of frequency modulation (FM) to counter static interference, a "major reverse salient on the expanding [AM] radio front."(146) "Here was a classic case of the independent inventor's radical attitude toward invention and development clashing with the conservative approach of the large corporation."(148) Armstrong was snubbed by RCA and NBC, both heavily invested in existing technology. A protracted legal struggle ultimately led to Armstrong's vindication in court but only after his death by suicide from the stress. In this example Hughes' previous explanation of the salient was essential to the subsequent use of the metaphor and its understanding.Utilizing another metaphor Hughes describes the Ford Motor Company Highland Park Plant in Detroit as a "great flowing tide of production" and offers alternative ideas which may have inspired Henry Ford's idea for the assembly line. The evocative images of the "flow of production" in the moving lines of the Chicago meatpackers, in tin can manufacture, and in moving conveyors in flour mills might have influence Ford. Hughes also sees a comparison between auto production and the demand for constant flow, mass demand, and mass supply of electric utility production which Ford learned while an engineer at the Edison Illuminating Company of Detroit. Hughes admires the uniqueness of Ford and Edison "who understood that there were no experts about the unknown; no theories, only hypotheses or metaphorical insights, about the uninvented."(215) The idea of mental images as the source of Ford's inspiration is a logical conclusion of Hughes' reasoning.To make his books more appealing and in deference to his audience, Hughes includes captioned photographs. But there is another, more analytic, reason for the pictures. On the one hand the images help the reader visualize history. On the other hand the pictures are symbolic of the verbal and visual metaphors imagined by inventors to understand their "moment of inventive insight."(75) A metaphor aids interpretive history and also, according to Hughes, in understanding the mystery of an inventor's creativeness. Pictures, whether in the mind or in print, help to clarify history. This is revealing. Hughes, from his literary understanding of the use for metaphors, ingeniously points to their usefulness also as a mental tool of inventors. Historians and inventors have something in common.Hughes argues the history of technology is critical to

understanding America's development but he is not a technological determinist. He does not see American technology as socially constructed, nor is America's development driven by technology because, he writes, "the makers of the modern world...[were expressing] long-held human values and aspirations."(5)

From the Independent innovators, to the beginning of research groups, to military research, to systems creators of Taylor and Ford, to military industrial complex systems of production. The first few and last chapters are the best. Edison had over 1000 patents, I have none. :-(

American Genesis: A Century of Invention and Technological Enthusiasm, 1870-1970 West Indian Workers and the United Fruit Company in Costa Rica, 1870-1940: 1870-1940 Madera Valley 1870-1970: Irrigation Water to Drinking Water Black Genesis: The History of the Black Prizefighter 1760?1870 Grace Hopper and the Invention of the Information Age (Lemelson Center Studies in Invention and Innovation series) Summary - The Invention Of Wings: Novel By Sue Monk Kidd --- An Incredible Summary (The Invention Of Wings: An Incredible Summary-- Paperback, Hardcover, Summary, Audible, Novel, Audiobook Book 1) The Elves of Cintra: Genesis of Shannara (Genesis of Shannara Series) Sarah: Women of Genesis: 1 (Women of Genesis (Forge)) Sarah: Women of Genesis (Women of Genesis (Forge)) An Adirondack Resort in the Nineteenth Century, Blue Mountain Lake, 1870-1900: Stagecoaches and Luxury Hotels The Somme 1870-71: The Winter Campaign in Picardy (Nineteenth Century Studies) American Genesis: Captain John Smith and the Founding of Virginia (Library of American Biography Series) Fatal Invention: How Science, Politics, and Big Business Re-create Race in the Twenty-first Century British Honduras: The invention of a colonial territory Mapping and spatial knowledge in the 19th century The Rise and Fall of the Paraguayan Republic, 1800Ã¢â ¬â œ1870 (Latin American Monographs; No. 48) American Vernacular: Buildings and Interiors, 1870-1960 Traqueros: Mexican Railroad Workers in the United States, 1870-1930 (Al Filo: Mexican American Studies Series) Paraguay 1515-1870: A Thematic Geography of Its Development (Bibliotheca Ibero-Americana / Latin-American Library) (Spanish Edition) Liquid Transportation Fuels from Coal and Biomass: Technological Status, Costs, and Environmental Impacts (America's Energy Future) Micro Irrigation Management: Technological Advances and Their Applications (Innovations and Challenges in Micro Irrigation)

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