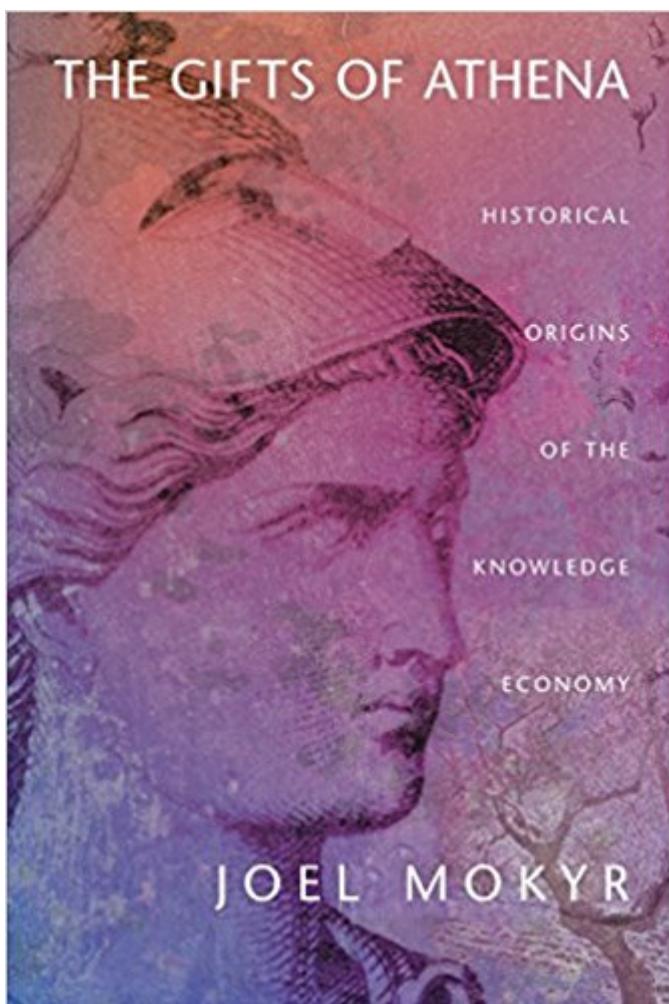


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# The Gifts Of Athena: Historical Origins Of The Knowledge Economy



## Synopsis

The growth of technological and scientific knowledge in the past two centuries has been the overriding dynamic element in the economic and social history of the world. Its result is now often called the knowledge economy. But what are the historical origins of this revolution and what have been its mechanisms? In *The Gifts of Athena*, Joel Mokyr constructs an original framework to analyze the concept of "useful" knowledge. He argues that the growth explosion in the modern West in the past two centuries was driven not just by the appearance of new technological ideas but also by the improved access to these ideas in society at large--as made possible by social networks comprising universities, publishers, professional sciences, and kindred institutions. Through a wealth of historical evidence set in clear and lively prose, he shows that changes in the intellectual and social environment and the institutional background in which knowledge was generated and disseminated brought about the Industrial Revolution, followed by sustained economic growth and continuing technological change. Mokyr draws a link between intellectual forces such as the European enlightenment and subsequent economic changes of the nineteenth century, and follows their development into the twentieth century. He further explores some of the key implications of the knowledge revolution. Among these is the rise and fall of the "factory system" as an organizing principle of modern economic organization. He analyzes the impact of this revolution on information technology and communications as well as on the public's state of health and the structure of households. By examining the social and political roots of resistance to new knowledge, Mokyr also links growth in knowledge to political economy and connects the economic history of technology to the New Institutional Economics. *The Gifts of Athena* provides crucial insights into a matter of fundamental concern to a range of disciplines including economics, economic history, political economy, the history of technology, and the history of science.

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## Customer Reviews

One of Choice's Outstanding Academic Titles for 2003 Winner of the 2003 Don K. Price Award "For most economists, Mr. Mokyr included, the Industrial Revolution is categorically different from everything that preceded it. . . . [He] suggests that, over time, growth will win out, if only because the power of certain ideas is greater than the resistance to them. So much the better."--Nic Schulz, *Wall Street Journal* "[A] masterful addition to literatures of economic history and economic growth. The product of a lifetime of scholarly study and reflection, Mokyr's book plainly did not spring full-blown from the head of Zeus. It merits a wide readership."--William F. Shughart II, *EH.Net* "The *Gifts of Athena* is an impressive study that clearly reveals Mokyr's mastery of a large literature on industrialization and economic growth. . . . Joel Mokyr has long concerned himself with big questions and making connections that delineate historical processes in new and interesting ways. The *Gifts of Athena* with its special emphasis on the centrality of the 'knowledge economy,' amply testifies to his stature as a leading historian of the Industrial Revolution."--Merritt Roe Smith, *Isis* "[A] fascinating, magisterial investigation into the wellsprings of modern economic growth and improved living standards. . . . The *Gifts of Athena* is a big-idea history book, a complex tale that interweaves science, technology, economics, sociology, and political science. . . . This is one that will stand the test of time."--Christopher Farrell, *Business Week* "Mokyr argues that knowledge is the key to understanding many of the most important developments in the past two centuries. The book is impressively wide ranging in its scope, containing a vast array of information and ideas. . . . I would hesitate to say the Mokyr has solved the problems of why the industrial revolution happened, but he would appear to have advanced the story a long way. This book is a fascinating integration of intellectual and economic history"--Roger E. Backhouse, *American Historical Review* "Situated firmly at the intersection of several disciplines--the history of science and technology, economic history, and economics--this fascinating and stimulating book explores the relationships among the expansion of knowledge, technological change, and economic growth since the 18th century."--Choice "Joel Mokyr, as one of the most important economic historians of our time, has written an instructive book about the knowledge-based origins of the rise and the future persistence of the Western World. . . . This book should be read not only by scholars, but also by

politicians!"--Helmut Braun, *Journal of European Economic History*

"Everyone talks about knowledge and technology, but Mokyr's brilliant book is the rare exception that talks about the what, when, why, and where of the knowledge revolution. The book skillfully navigates a vast territory from the Industrial Revolution to the World Wide Web, from the revolution in health to that in housework, from technophobia to institutions. Mokyr demolishes stereotypes and generates a steady stream of fresh facts and insights that keep you turning the pages."--William Easterly, New York University, author of *The Elusive Quest for Growth* "Economists, historians, and people who care about human progress will have to pay serious attention to Joel Mokyr's account of the role of knowledge in fueling economic development. He appears to be right about the West, and the implications for developing countries and their spending on education are staggering."--Margaret C. Jacob, University of California at Los Angeles "The benefits of knowledge for health and wealth have been axiomatic for centuries. Showing just how science, technology, and medicine actually pay off is still not simple. The *Gifts of Athena* bridges history and economics with unusual learning and originality. Wise owls will want this book."--Edward Tenner, author of *Why Things Bite Back: Technology and the Revenge of Unintended Consequences* "This is a splendid book. Highly illuminating and often strikingly original, it will be valuable to economists and economic theorists as well as to historians of all sorts but also, thanks to Mokyr's lively, often-provocative writing style, to a much wider audience."--Nathan Rosenberg, Stanford University, author of *Exploring the Black Box* "An excellent and much-needed book. The *Gifts of Athena* embraces the varied scientific breakthroughs that eventuated in both modern economic growth and rapidly rising life expectancy. Mokyr's intellectual scope is impressive, and he has done scholars a great service by creating this pathbreaking work. The need for knowledge of this type, especially among economists, is great."--Richard A. Easterlin, University of Southern California, author of *Growth Triumphant* --This text refers to an out of print or unavailable edition of this title.

In *The Gifts of Athena*, Mokyr argues for the importance of what he terms "useful knowledge" in industrial Britain during the eighteenth and nineteenth centuries. This useful knowledge, as opposed to purely speculative thought, and the access to that knowledge were central to the success of British industrialism. Mokyr builds on Denis Diderot's definition of the arts as laid out in the *Encyclopédie*: "every art has its speculative and its practical side." In all techniques, there are specific circumstances relating to the material, instruments, and their manipulation which only experience teaches. The eighteenth century saw not only

the beginning of the Industrial Revolution but the Age of Enlightenment as well. Mokyr uses the term "Industrial Enlightenment," seeing the two as connected and mutually reinforcing in many ways. Scientific developments of this period included the scientific method, scientific mentality, and scientific culture. These allowed for applied science to be put in the service of commercial and manufacturing interests. The role of science is The Gifts of Athena is a much more substantial account of Mokyr's views as delineated in The New Economic History and the Industrial Revolution's introduction. The emphasis is on the importance of understanding techniques, generalizing them, and connecting them with formal propositional knowledge (science). In analyzing the role of knowledge in technological innovation, Mokyr stresses the importance of collective knowledge and specialization. The increasingly systematic approach of the Industrial Enlightenment was still relatively small in the eighteenth century. Most useful knowledge of the time was uncoded and passed from master to apprentice. This traditional method limited the spread of knowledge, or to use Mokyr's wording, resulted in a narrow epistemic base of technology. This narrow epistemic base widened after about 1750 and with it came a stream of microinventions. The availability and spread of scientific knowledge reduced access costs to the information. Significantly, even non-specialists were able to get access. Mokyr touches on this in his introduction in The New Economic History and the Industrial Revolution, particularly in the statistics which show a lag between the development of technologies and when these technologies were able to affect aggregate statistics. Mokyr concerns himself with aggregate knowledge because we know more as a society and can benefit from the end results of complex production processes without having to understand every aspect. The narrow epistemic base, a significant feature of pre-1750 societies, was a crucial factor for the mini-industrial revolution of the Renaissance's transience. Other factors that differentiated the mini Renaissance-industrial revolution included Malthusian traps such as organic economies and institutional negative feedback. Cardwell's Law, quoted by Mokyr, states that "the diversity inside a wider unity has made possible the continued growth of technology over the last seven hundred years." Most periods of technological innovation have been rather short. One thinks of the northern Italian city-states in the fifteenth century. Mokyr explores the ideas of Cardwell suggesting that the fragmentation of Europe allowed for the "torch" of innovation to be passed from one country to another after the short period of creative innovation started to fade. However, fragmentation alone, Mokyr notes, is not enough to guarantee technological innovation. Cooperation between political entities as well as competition is necessary. Mokyr gives the examples of the Hanseatic League and later the Dutch provinces, noting the importance of cooperation in the face of

significant external pressure. Mokyr spends a chapter of the text analyzing resistance to technology, arguing that this came from two main sources: the interests, economic and political, of the status quo and intellectual resistance. Particular forms of resistance vary, the most well-known example being the Luddites smashing machinery. Other forms of resistance included capital loss and human capital. The former includes owning machines that became obsolete. The latter addresses the skills and experience of workers. As the ability to learn new skills declines with age, older workers were more likely to resist new technologies. Beyond the self-interest of particular actors, other major reasons for opposing new technology were fear of unintended consequences and path dependency. The role of religion is addressed in this section but Mokyr does not simply list it as a form of resistance. Religion can be a force for conservatism. He gives the example of the Indian Caste system. But he also notes that the medieval monasteries served as conduits for information. Mokyr concludes that religion was just as much a source of inspiration for innovators as it was a form of resistance. The resistance to new technologies failed primarily because the British government supported them both at the central and local levels. Mokyr notes that acts of Parliament made government support even more explicit in 1769 when the tampering of bridges and engines used in mines became a capital offense.

This review refers only to the kindle edition. This is a great must-read book but DO NOT BUY THE KINDLE VERSION. The electronic version was apparently OCR generated with no checking. Many words are scrambled, and the occasional (but very important) math is complete gibberish. I ended up buying the paperback any way.

Not Mokyr's best. It reads like a PhD dissertation. The overall rubric of kinds of knowledge (the distinction between theoretical knowledge and practical knowledge tweeked a little and dressed in drag) is very unstable.

Great read

Great

This richly-documented economic history is a worthy successor to Mokyr's *The Lever of Riches*, not least because it includes a more convincing account than his earlier work of the role played by the ideas of the Enlightenment in the making of modern capitalism .

"Gifts of Athena" is an outstanding piece of work with profound consequences for research and policy. Its intellectual radiance will finally make the remaining shadows of conventional economic history fade into oblivion. It guides the perplexed, reassures the convinced and guides the uninitiated.

Partly because it is too wide-ranging to settle on any sound-bite answer, this is one of the better books around to examine the question of the sources of the West's technological and economic supremacy. In "The Gifts of Athena", Joel Mokyr sets his sights on three objectives: First, to establish that expanding knowledge has been the engine driving the world's expanding economy over the last few centuries, rather than the other way around. Second, to explore the factors that control the discovery and application of new knowledge, so as to get a better grasp on why the Industrial Revolution took place in Europe, and why England might have led the way. Finally, to speculate on what I found to be a startling question: what's to prevent the explosive expansion of technology to which we have become accustomed from falling into stagnation, as lesser periods of innovation have done throughout history? He accomplishes the first objective handily. Apparently some economists believe that the Industrial Revolution must have been driven primarily by economic forces (new means of capitalization and rising demand) rather than by the availability of science, because of the multi-century lag from Kepler and Newton to the economic blastoff. But Mokyr argues that there was a necessary intermediate stage, the "Industrial Enlightenment", which structurally altered the relationship between "what-is" and "how-to" forms of knowledge, as well as making both forms radically more accessible to artisans, entrepreneurs, and the general public. His explorations of the other two questions are fresh and illuminating, but a bit picaresque. There's no overarching theory here and, except for parts of the chapter on adoption of new technology by households, little quantitative rigor. Where the discussion excels is in its opening pages, which lay out a useful systematic language for talking about kinds and qualities of knowledge; in its readiness to think outside the market-explains-all box; and in its unflagging supply of vivid historical examples. Among many piquant ideas, the central insight I brought away from this work was the extent to which the phenomenon of "science" is a collection of socially enabling institutions, rather than just a Baconian method. Not that Mokyr holds much brief for the notion that the conclusions of science are socially constructed. Rather, its conclusions become accepted and transmitted, and therefore available for economic use, only by the grace of a set of social relationships and conventions that Bacon's scheme did not mandate, and which might just as easily not have taken

place. I should note that where economics are concerned, I'm very much a layman, and not really even a particularly informed one. ("Oh, Schumpeter, yeah, I heard of him somewhere.") I found Mokyr's text challenging but frequently engaging, and comprehensible throughout.

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