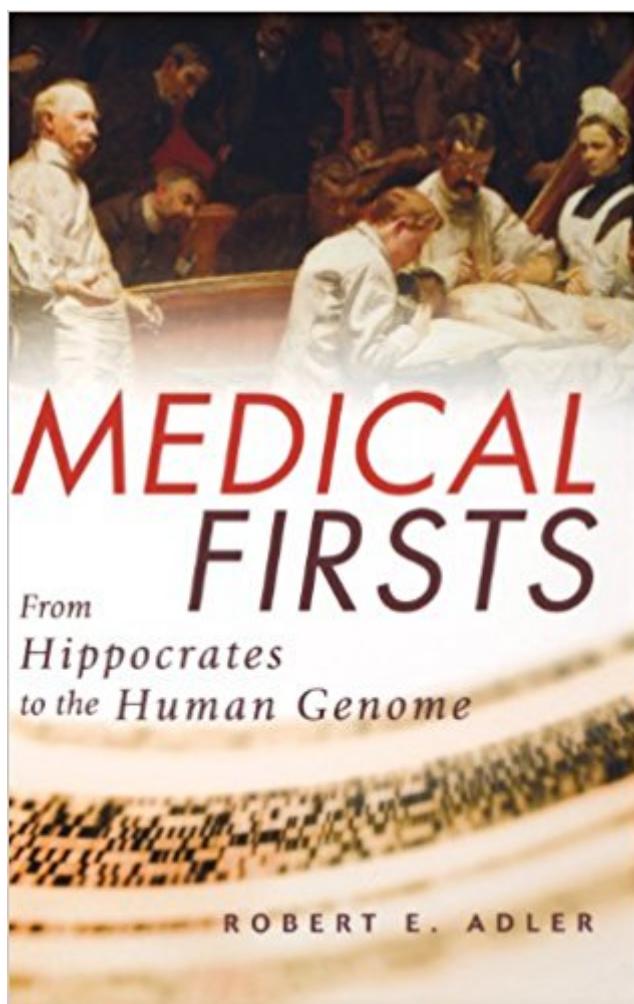


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# Medical Firsts: From Hippocrates To The Human Genome



## Synopsis

An exploration of medical discoveries—from the ancient Greeks to the present—"Always help, or at least do no harm." Following this simple yet revolutionary idea, Hippocrates laid the foundation for modern medicine over two millennia ago. From the Hippocratic Oath to the human genome, from Pasteur's germ theory to the worldwide eradication of smallpox, *Medical Firsts* brings to life 2,500 years of medical advances and discoveries. Organized chronologically, the book describes each milestone in a vivid capsule history, making it a fascinating and wonderfully readable resource for anyone interested in medicine's past progress and future promise. Robert E. Adler, PhD (Santa Rosa, CA) has worked as a psychologist and science journalist. He writes about a wide variety of scientific and medical topics for *New Scientist*, *Nature*, and other publications and is the author of *Science Firsts* (0-471-40174-9).

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## Customer Reviews

In this cursory though delightful companion to his previous *Science Firsts*, Adler ably combines good storytelling, clear and cogent scientific explanations, a respect for science over superstition and a love of what he sees as one of humanity's "finest and most difficult" arts: "the application of medical knowledge to individual human beings like you and me." Through short, chronologically arranged histories of individuals who have defined medicine, Adler presents a compelling narrative arc from Hippocrates' dream of "human mastery of health and disease" to current efforts to "decode, understand, and manipulate genetic information." Adler vividly portrays the heroic efforts of such

greats as Herophilus, who "discovered and described the prostate, the spermatic duct, the Fallopian tubes, and the ovaries" in the fourth century B.C.; Abu Bark al-Razi, whose 10th-century A.D. description of smallpox reads like "a modern diagnostic manual

In this slim but powerful volume, science writer Adler chronicles two-and-a-half millennia of medical history in all its fits, stalls, and starts. More than that, with lively narrative and numerous illustrations, he breathes life into each of the giants who laid a stepping-stone in medicine's path from cave drawings and charms to sophisticated, computer-assisted diagnoses. The contributors to the annals of medical knowledge he cites include the most famous names--Hippocrates, Pasteur, Freud, Alexander Fleming--and some not so commonly known, such as pioneering gynecologist Soranus (first century C.E.); Ibn al-Nafis (ca. 1210-88), credited as the first to understand and describe pulmonary circulation; and John Snow, an important figure in the war on cholera. From the parental background of Galen (130-200), the self-proclaimed "Prince of Physicians," to the social issues and political turmoil surrounding Margaret Sanger's fight for birth control, Adler discusses each figure's personal, social, and political history as it affected his or her contribution. A handy, highly readable reference. *Donna Chavez*Copyright © American Library Association. All rights reserved

There are numerous lessons to learn from this brief history of medical discovery. One of the foremost is that it is extremely hard to correct a false idea or theory, like Galen's theory of humors, once it has won public acceptance. That theory, which was glaringly false to anyone who took the time to actually examine it, was assumed to be true for over a thousand years because of social stigma and cultural and social norms. Another important lesson that I hope I never forget is to base important conclusions on thorough research, data and actual experiments rather than going with what others tell you or assume. Once something has been thoroughly researched, it takes a lot of internal strength to stick with what has been learned, in the face of opposition, and great courage not to compromise truth for the sake of people pleasing. If the stories of Semelweiss, Visalius and Peracelsus teach us anything, it is that it is possible for the majority to be wrong and simply because an idea has authority or is widely accepted does not mean its correct. That being said, they also show that it is possible to disagree and recognize that things are be wrong in a lot of ways and still be respectful and civil and get along well with society as in the case of William Harvey. It is possible to have radically divergent ideas and still get along with people and not let it greatly affect your personal life or sanity. Another comment I would make on the book is that it may seem easy to simply discard organized religion after looking at what was done in Europe by the Catholic church

during the inquisitions and how hostile it was towards scientific advances in dissection, anesthesia, contraception and others, but doing so is equally close minded without doing the research. I think the author, for the sake of conflict, tends to suggest the conclusion that religion is always hostile towards medical progress. If history is any teacher, we should learn that civil discussion the far reaching implications of medical breakthroughs from both moral and scientific points of view are better than allowing them to descend into a contest of power between religion and science. The author may have been slightly biased using religion as the bad guy, but overall gives a quite excellent telling of some of the most beneficial advances to humanity and the human stories that surrounded them. Adler opens the book predictably with a man who will be forever named when speaking of Western medicine. Hippocrates was to medicine what Plato was to Philosophy. Although some of his ideas weren't completely accurate, he left a tradition and touched on some golden truths that continue to be relevant today. According to the book, his major contributions were specifically to bring medicine out of the realm of gods and superstition into observable, natural phenomena. He practiced less invasive treatment favoring the least sensational and methods of diet and exercise before anything radical to a patient. His thinking formed the oath that physicians take and includes that they should refrain from having relations with patients or relatives of patients and that health information learned about patients should be kept confidential. His insistence on medical ethics "continues to echo in many current controversies." Hippocrates taught scrupulous honesty and to help or at least do no harm and that the three realistic goals of medicine were to alleviate patient suffering, reduce severity of illness and refrain from treating the untreatable. He said "Life is short, art is long, opportunity fleeting, experience misleading." and he "never fled back to the comforting mysteries of religion but stuck to scrupulous observation, keen analysis." This is the ideal medicine still strives for but as long as practiced by humans seems always to be tripped up by our frailties and short-comings. Adler then goes on to name some of the prominent physicians like Herophilus and Eustratus whose work surged forward along with the progress of civilization in ancient Alexandria. For a bright but brief high point they were able to practice dissection and dispel some mistakes perpetuated in anatomical understanding. Unfortunately their followers, "Rather than devoting themselves to the difficult, unpopular and sometimes dangerous practice of dissection and hands on studies, fell into theoretical disputes." Some Romans like Marcus Varro also had a vague idea of germs but those ideas died like the fall of the Roman empire. With the small exception of Soranus, medical understanding "largely disappeared in the darkness and superstition that settled over Europe" during the middle ages. "Medical treatment of women, along with medicine in general became a host of charms, gruesome concoctions, blood letting, and purging.... Sadly medical

pioneers had to reinvent much of what had been known more than a millennium before." One of the unknowing contributors to this downfall was the towering Greek figure Galen whose brilliance, experimentation and large volume of written works essentially intimidated physicians out of any original thinking for about the next 1500 years. Galen looked for mathematical precision in the face of medical uncertainty and established himself as an authority with a few tricks that impressed the leaders of Rome gaining him money, prestige and 20+ scribes. Since dissecting humans was forbidden at the time, many of Galen's experiments were performed on apes and other animals. Combining his limited experimental research with the Greek's love for pure thinking he developed the theory of humors: blood, phlegm, yellow bile and black bile which could explain just about any medical condition. "Tragically, it was not Galen's passionate advocacy of anatomical study and physiological experimentation that endured, but the theory he had proclaimed. "It was not until the Renaissance anatomists Andreas Vesalius and William Harvey showed that Galenic assumptions were wrong that began the long, slow and arduous process of rebuilding medicine on a scientific foundation." One of the forerunners and rogue scientific prophets who first contributed to the downfall of Galen's unquestioned theories Paracelsus. Paracelsus was a bombastic, independent thinker who like the protestant reformers unabashedly stood against the status quo of the time questioning both their social hierarchy and theories. He lectured in German rather than Latin. He questioned what actually made the charms and treatments being administered effective and advocated applying alchemy, the use of solvents, evaporation, precipitation and distillation be used to make medicine instead of gold. Probably partially because of his outrageous personality he was not widely accepted and it took centuries until any of his ideas really took hold. The next major blemish against Galen's monolithic, untouchable legacy came from Andreas Visalius who from a young age was skilled at dissection. He came from a family of doctors and became a professor quickly where broke with tradition by doing dissections himself. While dissecting he encountered a number of discrepancies between what Galen's texts and what was actually in front of him. Vesalius took a stand and worked for years on a definitive anatomy book *De humani Corporis Humanis* (the human body) which, like giving a lay person access to the Bible, gave open access to an understanding of the human body to all. In the years that followed, opposition flared up mainly from Vesalius's own former professor and quite sadly Vesalius caved in and burned his anatomical studies and unpublished commentary. He married, became a practicing physician and never spoke of his theories or research again. Although he gained prominence he seemed to have regretted his decision to give up research in exchange for respectability. "There may be no more fitting memorial for Visalius than his own in *Fabrica* "genius lives on, all else is mortal." Before Europe could emerge

from the darkness of middle ages, there was another chapter of gross ignorance that bogged down any other medical advances. As Protestantism began to weaken the Catholic church, the church bore down even harder by publishing *Malleus Maleficarum* blaming evil on "witches" who were mostly poor women. As public outrage was stirred against these helpless women, Johann Weyer was a physician who only saw vulnerable, mentally ill victims and wrote *De Praestigiis* in response to the church's publication. Weyer was eventually silenced and witch burning peaked in the 1600's a century after Weyer. "As the Holocaust, Soviet gulags, and Cambodian killing fields (and many others) show society has not freed itself from the potential to descend into madness, especially when fanatical ideologies take control of the state...Our best individual antidote may be Weyers admonition 'love your fellow beings, destroy errors and fight for truth without cruelty. Know with what pain truth is obtained and with what great difficulties one guards ones self against errors.'" Out of this heavily authoritative atmosphere William Harvey later emerged and stuck another important blow against Galen's theory of humors. Harvey in contrast to Paracelsus, Visalius did so without making the least disruption in the social order. He calmly calculated that the heart circulated blood and that blood did not originate in the liver as Galen had taught. Harvey valued patient insightful observation and ruthlessly dissected every idea under the scalpel of experiment...and staunchly refused to speculate about grandiose questions showing it was infinitely more productive to ask how than why." One other major lesson in the history of medicine came from later innovations in the US. Along with purified medicine, came the application of Nitrous oxide and ether as anesthesia first used to treat tooth extractions. After a halting attempt by Horace Wells to get its acceptance known, it took two major personalities William Morton, Charles Jackson to finally bring anesthesia closer to widespread recognition but the greatness of this breakthrough proved to be too much even for these strong personalities. Jackson, Morton and Wells fought bitterly over who got credit for it and it eventually broke them, essentially driving them mad. Another cautionary tale came with the advance of chemistry applied to medicine by Ignaz Semmelweis who recognizing the differences in the death rates at different delivery wards of hospitals, eventually figured out that he and his fellow doctors were the cause of the death by spreading contamination between women and cadavers. He immediately started requiring doctors to clean their hands but outside of his own hospital faced resistance because it required doctors to recognize "they had caused the agonizing death of many young mothers." Rather than accept this ugly truth, doctors attacked Semmelweis who retreated to his native Hungary. The weight of the truth may have been partially what drove him to insanity and he died in some ways a martyr for the the cause of scientific truth. Adler goes on to give a brief recounting of John Snow and the emerging practice of epidemiology, Pasteur and Germ Theory. He

tells of Freud and the unconscious mind. More modern tales like Ivanovsky and the discovery of viruses and Margaret Sanger and the contraceptive pill. Then Organ transplants, In Vitro Fertilization, Eradication of Small-Pox, Kuru and Prions, the Immune System, and sequencing the human genome. These breakthroughs while incalculably valuable become much more the product of large groups and do not have the personal details of the story of a single genius. He also briefly goes through the story of X-Rays. In contrast to Semelweiss and the discoverers of Anesthesia, describes how Roentgen discovered X-rays. Unlike earlier pioneers, there is very little resistance to his discovery and people even used them for entertainment until radiation sickness and the darker side of X-Rays were discovered. Unlike the pioneers of anesthesia, Roentgen in a more modest manner and more reminiscent of current scientists, refusing to give a public speech for his Nobel Prize and donating his prize money to furthering research. He never sought recognition for his findings and was probably better off for it when looking at the fate of those that did. In the last chapter Adler talks about the future of medicine and along with him we all watch anxiously as human understanding and scientific progress eke forward benefitting medicine along the way. We may in fact some day be able to reverse aging and but when we do I do not think we will have left aside the moral roots remind us why they are given.

See what a fantastic writer with an credible amount of investigation into the subjects can deliver. Each chapter is clear, stimulating and very interesting. No boredom in these pages.

Excellent read for medical professionals and lay people alike. I would recommend it to all of my friends. Awesome stuff

used it for a class and it came in really handy for reading on the go

I came to this book with little to no prior knowledge on any and every field of medicine, just interested in the history. A quarter of the way through the book, I already knew that this was going to be a text I'll never forget. As someone still young and unsure of their future, Medical Firsts immediately inspired me to work towards the field of medicine. Adler writes clearly and concisely, whilst still utilizing simple enough terms for both those completely unfamiliar with science and those who are learning. Adler has carefully chosen the hallmarks of history that he will touch on, and makes sure to include all contributors and events without any sign of bias. My personal favourite was the fact that he endeared you to each individual mentioned, with mini-biographies and accounts

of their unique personalities. He then goes on to list works for you to read on your own, either throughout the reading or at the end of it ('further reading and sources') - needless to say, I have a new wishlist of books I'd like to get to. Please, please, read this book.

I highly recommend this book, especially to those who practice or plan to practice in the field of medicine. Even for non-physicians, I think reading Dr. Adler's "Medical Firsts" will be a very enriching and worthwhile experience. The author has created an educational yet highly entertaining work in which he has chosen to write about specific physician/scientists throughout history who he feels were the most visionary and heroic in their contributions to the advancement of Western Medicine. In reading the book, I feel as if I have been taken on a unique journey through medical history, which at times appears like a complex maze. Along the way, the author describes some tragic blind alleys where several of these physician/scientists who had come forth with potentially life saving discoveries were shunned and considered to be heretics because they dared to challenge the status quo with their scientific approach to medical research and practice. In each concise and well-written chapter, the author's respect and admiration for the enlightened scientific method practiced by these venerable physician researchers comes through vividly. I found the author's message very inspiring: if we are able to trust and support an unbiased and scientific approach to the alleviation of suffering and disease, we may someday fulfill the great promise of these astounding medical advances to offer superior quality of life for all of humanity.

Any health care consumer -- or provider -- should be fascinated by these stories of how the health care we know today came to be. It was amazing to me to read how much the ancients knew about the human body, and how accurately, and then how "medicine" descended into the miasma of the Middle Ages for over a thousand years before painstakingly, and with great difficulty, enduring personal animosity, crawling back to what the ancients knew, and beyond to what medical science knows today. All related in well-told stories about real people, described warts and all. Some of those people I had never heard about before but even the others of whom I had read elsewhere came alive as people, with new information and more background. I heartily recommend this book for anyone with an interest in healthcare, or in history. Not only informative, but very enjoyable reading.

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