

Technology

and the **FUTURE**

Albert H. Teich

11th
Edition



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Preface

WiMax is coming! Maybe. Someday. WiMax, which stands for “Worldwide Interoperability for Microwave Access,” is the latest entrant into the broadband sweepstakes. WiMax is supposed to replace cable and DSL connections for Internet access at fixed locations such as homes and offices. Mobile WiMax is supposed to provide high-speed connections to mobile devices — laptops, cell phones, and the like — almost anywhere. To the user, it’s similar to Wi-Fi, except that it’s long-range and covers a wide area, rather than a home, a hotel, or a coffeehouse. South Korea has had WiMax available since 2006, although it hasn’t yet really caught on. Implementation of WiMax has been even slower in the U.S., although a recent deal in which Intel, Comcast, Time Warner, and Google are said to be investing a total of several billion dollars may speed things along.

Whether WiMax makes it or not, we are all increasingly connected and taking it for granted. As I write, my daughter-in-law in Milwaukee has just given birth to my newest grandson. There’s Wi-Fi in the hospital, and within half an hour after he was born, my son, who has his laptop in the hospital room, had posted the new baby’s vital statistics on his blog. A few minutes later, the newborn’s picture was up on the site and available for anyone, anywhere in the world who should happen to care, to see. I first saw the picture early this morning on the laptop that resides in our kitchen, but if I had been out of the house, in the neighborhood, walking around downtown, or out of town in Kalamazoo, Kiev, or Kuwait, I could have read the blog and seen the picture using the mobile Internet access on my BlackBerry.

Except perhaps by science fiction writers, none of this was even remotely imagined when I put together the first edition of this book in 1971. The preface for that edition (and several subsequent editions) was written on a typewriter and the selections were cut and pasted into the manuscript using scissors and tape rather than `ctrl-c` and `ctrl-v`. The manuscript was mailed to the publisher — not FedExed, not e-mailed. And the galleys and page proofs were returned to

me the same way. The changes over the past several decades continue to astound me (at least when I take the time to think about them), but for the current generation of undergraduates and future undergraduates, they're routine — an ordinary part of life — just like automobiles and corded landline telephones are for people of my own generation.

The future keeps coming along faster than we expect. If I didn't update this book every few years, I would need to retitle it *Technology and the Present* or perhaps *Technology and the Past*. In that spirit, and taking into account the comments of users and reviewers as well as my own sense of the relative importance of various topics and the timeliness (or its lack) of various chapters, I have again performed major surgery on the book. I have dropped more than a third of the chapters that appeared in the 10th edition and replaced them with more current and/or more relevant articles. In one instance, I have brought back a still-timely chapter from an earlier edition that raises fundamental questions about the nature of a key building block of our society — the family. And, for the first time since I created this book, I have included a chapter of my own, part of a new concluding section on governing technology.

Despite the changes, much of the book will look familiar to those who have used previous editions. In Part I, "Thinking about Technology," several well-known authors raise big questions: What is technology? Is it good, bad, or neutral (or good *and* bad)? Is it synonymous with progress? How does it influence society and how does society influence its development? Leo Marx and Robert Pool headline this section. Edward Tenner finds meaning in a technology so simple that most people don't actually regard it as a technology — shoelaces. Alvin Weinberg's essay on the "technological fix," which follows, is one of three articles that survive from the first edition. Though dated, it still raises important questions and seldom fails to provoke discussion. The chapters by Samuel Florman, Langdon Winner (difficult, perhaps, but well worth the effort), and the newly included chapter from David Edgerton's recent book, *The Shock of the Old*, should do the same. My hope in Part I, as elsewhere in the book, is to preserve the best elements of previous editions while also bringing in more current thinking.

The forty-year-old, but still very relevant, debate over the role of technology in society between the late Emmanuel Mesthene and John McDermott, like the Weinberg chapter a feature of the book since the first edition, comprises Part II, entitled "Debating Technology: 1960s Style." Both the substance and the rhetoric of the Mesthene–McDermott debate contrast with Part III, "Debating Technology: Twenty-First-Century Style," in which Bill Joy, a computer scientist responsible for several major software innovations, presents his rather scary vision of a future in which nanotechnology, genetics, and robotics converge and threaten the existence of humanity. Responding to Joy are John Seely Brown and Paul Duguid, as well as inventor Ray Kurzweil, a friend of Joy's who differs sharply with him when it comes to views of the future.

The next two sections turn to more concrete, current issues and explore some of the ethical, social, and human dimensions of a number of specific areas of technology. Part IV examines several critical issues facing society today, all of

which have scientific or technological dimensions: global climate change, terrorism, stem cell research, genetic engineering, and the implications of recent and future advances in neuroscience. Many people believe climate change is the most vexing problem facing global society in the twenty-first century. While agreement on what to do about it is still far off, all but a few of the most ardent skeptics agree that the problem is real and must be addressed. The article included here, by Collins et al., describes the scientific basis for the increasingly powerful consensus on the nature of this problem. It's based on the 2007 report of the Intergovernmental Panel on Climate Change and explains, in terms that don't require a Ph.D. in atmospheric physics to understand, how and why the Earth's climate is changing. The two articles that follow discuss another pressing global problem, that of terrorism. The first is an excerpt from the report of the commission established by the federal government to give an account of the tragic events of September 11, 2001 and to recommend ways to prevent future attacks. The second is a discussion of civil liberties issues raised by the new laws and policies that were put in place in the wake of the attacks.

The four other articles in this section all involve advances in life sciences — the opportunities they offer and the ethical issues they raise. Research involving human embryonic stem cells offers the tantalizing prospect of breakthroughs in the treatment of diseases and injuries, but, in the minds of critics, also opens the door to possible abuses of the sanctity of human life. Christopher Thomas Scott lays out the basic features of this debate clearly and concisely. Alta Charo's chapter explores the complexities of family life in an age of advancing reproductive technology and changing social values. Michael Sandel takes a conservative approach to the possibilities of designer children and other kinds of human enhancement created by developments in biotechnology. And Henry Greely speculates on the meaning of advances in neuroscience which, some scientists believe, will soon provide a means of gauging an individual's mental state — i.e., reading his or her mind — with an imaging device.

Under the heading of information and communications technology in Part V are an article by computer historian Paul Ceruzzi on why those most responsible for creating the information technology revolution failed to anticipate its extent or its impact, followed by a curmudgeonly piece by poet and farmer Wendell Berry, on why he rejects the idea of using a computer to do his writing. An up-to-date, broad-based survey by philosopher Deborah Johnson of the ethical issues raised by computers and information technology replaces a less-current chapter on this topic.

Complementing an article by lawyer and Internet guru Lawrence Lessig, in which he expresses concern that the promise of the Internet is being wasted as outmoded ideas choke off its innovative potential, is a chapter by Mitch Kapor (developer of Lotus 1-2-3, the first spreadsheet program to achieve widespread acceptance, and cofounder of the Electronic Frontier Foundation) discussing the impact the Internet and associated technologies are having on the entertainment world and on intellectual property more generally. Rounding out this section is an article by writer and cultural critic Lee Siegel who calls on us not to ignore the fundamental questions of how the Internet is changing ourselves and our society.

The last section is entirely new. In a sense, it is a return to the roots of *Technology and the Future*, the first edition of which concluded with several chapters that sought to provide policy prescriptions for the problems raised by some of the articles in the earlier parts of the book. In the current edition (more than 35 years later), I've wrapped up the book with two chapters on governance — one of my own in which I review the relationships between governments and technology (an article I wrote originally for an encyclopedia of science, technology, and society) and the other by political philosopher Francis Fukuyama and his colleague Caroline Wagner on the role of international institutions in dealing with technological advances and the problems that such advances raise for those institutions.

As in previous editions, my selections are — by design — a mixed bag. Not all students or all instructors will find every reading to their liking. Readers will probably love some and hate others, find some fascinating, others tedious. I've chosen the individual articles with an eye toward diversity in their authors' views of technology and political leanings. They do not necessarily represent my own views, and I do not necessarily endorse their perspectives. As a whole, however, the book reflects what I hope is a balanced view of the important issues in the field of technology and society, a view that I hope will be useful to others who are interested in these topics.

Technology and the Future has been a part of my professional life throughout most of my career. It is gratifying to have watched the growing interest in the study of technology, society, and the future in American colleges and universities over the past several decades and to feel that the book may have made a modest contribution to this important intellectual development. Throughout the life of this book, I have benefited from the interest, suggestions, and feedback from the book's users. I am indebted to them all for the ideas that they shared with me, some of which have helped to shape this volume.

My thanks go also to the staff of my current publisher, Cengage Learning (formerly Thomson Wadsworth), to Bedford/St. Martin's, and finally to St. Martin's Press's College Division, whose editors had the foresight to publish the first edition of this book in 1972 and who, through a generation of staff changes, mergers, acquisitions, and restructurings, remained helpful, interested, and unfailingly supportive. I have been fortunate in having a series of editors over the years with whom it has always been a pleasure to work.

I wish to acknowledge the advice of those who have contributed comments and suggestions that helped shape this edition:

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Finally, a very special note of gratitude goes to my family: my wife, Jill; my daughter, Samantha; and my sons, Mitch and Ken; their wives Gretchen and Sara; and my grandchildren, Calvin Avery, Madelyn Elise, Sylvi Reine, and the

newest addition, Charlie Joel, for the meaning they give to my life and for the strength I draw from our relationships.

Once again I invite readers — both faculty and students — to contact me with comments and suggestions. I can be reached most readily by e-mail at ateich@aaas.org, or through the links on my web site, which can be found at <http://www.alteich.com>. The web site also contains supplementary resources related to the book, including links to more information about the authors of the various articles, tables of contents of earlier editions, the full text of several hard-to-find articles from earlier editions, my personal home page, and more.

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