

COMPUTERS AND SOCIETY

STANLEY ROTHMAN AND CHARLES MOSMANN



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The Technology
and its Social Implications

Stanley Rothman
Charles Mosmann

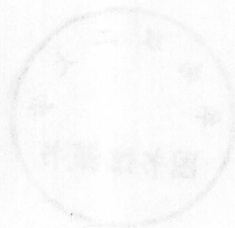


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COMPUTER AND SOCIETY

The Technology
and its Social Implications

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PREFACE

To write a textbook implies that there is something to teach. The social implication of computers is not a discipline. It has neither algebra nor body of controlled experimental evidence. There has been a great deal said on the subject, which in itself is data. Congress has investigated, the press have viewed with alarm, and social scientists have forecast doom.

Professionals in the computer industry have, with few exceptions, ignored the subject; the few who have given it their attention have tended to view it as a technical problem to be solved by more refined engineering techniques. But what is the subject and how is its data to be organized?

Any text which falls between traditional academic disciplines is likely to be seen as something of an anomaly. This book

starts out in the guise of a text on technology and, halfway through, adapts the methods and data of a social science. It seems incontrovertible to the authors that this is the only way it is possible to present the subject at all. A course on the social consequences of computers in which students are given no technical facts about computers is bound to leave them with little they can use. A course that teaches the technology but not the social impact is of no value to the majority of students who will have no professional contact with computers. Thus we are left with the need for a course that presents the basic facts of the technology and then constructs an analysis of the social issues on this technological foundation. That is what this book aims to do.

Who should teach this course? The authors hope that many interested teachers will try it. The computer science or mathematics teacher may find the latter sections harder to teach than the earlier ones; the social scientist may find the reverse to be the case. But we live in a world where it is essential that we all bridge this gap.

What department should offer it? This makes little difference, except in the matter of student expectations. No matter what the course is called or how it is described, many students will expect engineering from engineers and sociology from sociologists, facts from scientists and opinions from humanists. In some institutions, departments are emerging where this course fits naturally—departments dealing with the many interdisciplinary problems the world seems to face today. A good name being used for one of these departments is "social ecology." This book may perhaps be most fairly judged as a text in social ecology because it deals with the ways in which man's technology and social institutions interact.

What institutional resources are required? This is emphatically not a programming text and no computer is required for the students' use. However, if there is a computer nearby, it would be of value to have the students visit it, watch how it is used, and talk with the people who run it. The references and suggested ancillary readings assume at least a minimal technical library with the leading computer periodicals and some major books on computing. If the college library cannot supply these resources, the teacher should consider finding some way of making them available before the course begins. Our best hope is that some of the students will be curious, contrary, belligerent, or skeptical enough to go to the library to find the weapons to refute statements with which they take issue.

In writing a book about a subject where much of the data is of questionable objectivity, it is hard to be totally confident of one's lack of bias. The authors have lived and worked with computers for many years and can hardly be expected to view the computer and its institutions as unquestionably evil. On the other hand, they have lived in the world, too, and know that no technology, accepted uncritically, is necessarily an unquestionable good. Part I of the book attempts to survey the ground that will be covered and to

exhibit the point of view and the method the authors plan to use.

Discussion of the subject requires, as we suggested above, a basic minimum knowledge of what a computer is, what it does, and what it will some day be able to do. Part II provides the student with facts about the computer with which he can cut through some of the distortions that swell popular computer literature and which he can use to form his own opinions on how computers can best be used as tools of human progress.

Part III attempts to exhibit the ways in which technology affects human affairs. A range of computer applications is described, first presented in a value-free form and then analyzed in terms of social and ethical issues.

Part IV deals with the ways in which technology can be controlled for man to reap its benefits without suffering the threatened curse of unplanned and uncontrolled technological progress. Finally, Part V talks about the future and the student's possible post-college world.

A textbook, rather than inundating a student with facts and opinions, should give him some examples to work, questions for research, or some way of testing his newly acquired knowledge. In any area, but particularly in one so new and subject to such radical change, the goal must be to teach the student how to arrive at his own judgments about questions not yet evident, unasked in his text or by his teacher. Thus the examples will ask the student to think about new computer applications, to seek precedents in non-computer systems, to develop techniques for dealing with new questions, or to predict the influence of systems on their users or subjects (which in itself will involve him in understanding how fundamental human characteristics are involved with automated systems).

The genesis and motivation for this book is a serious concern for a situation that, in the face of uninformed citizens and a naïve press, may turn in either of two unacceptable directions. A powerful threat to freedom may go uncontrolled; a major tool of progress may be needlessly suppressed. The only means of steering a path between these alternative dangers is by having, in voting booths as well as in government, in readers as well as in writers of the news, men and women who understand technical, political, and moral issues.

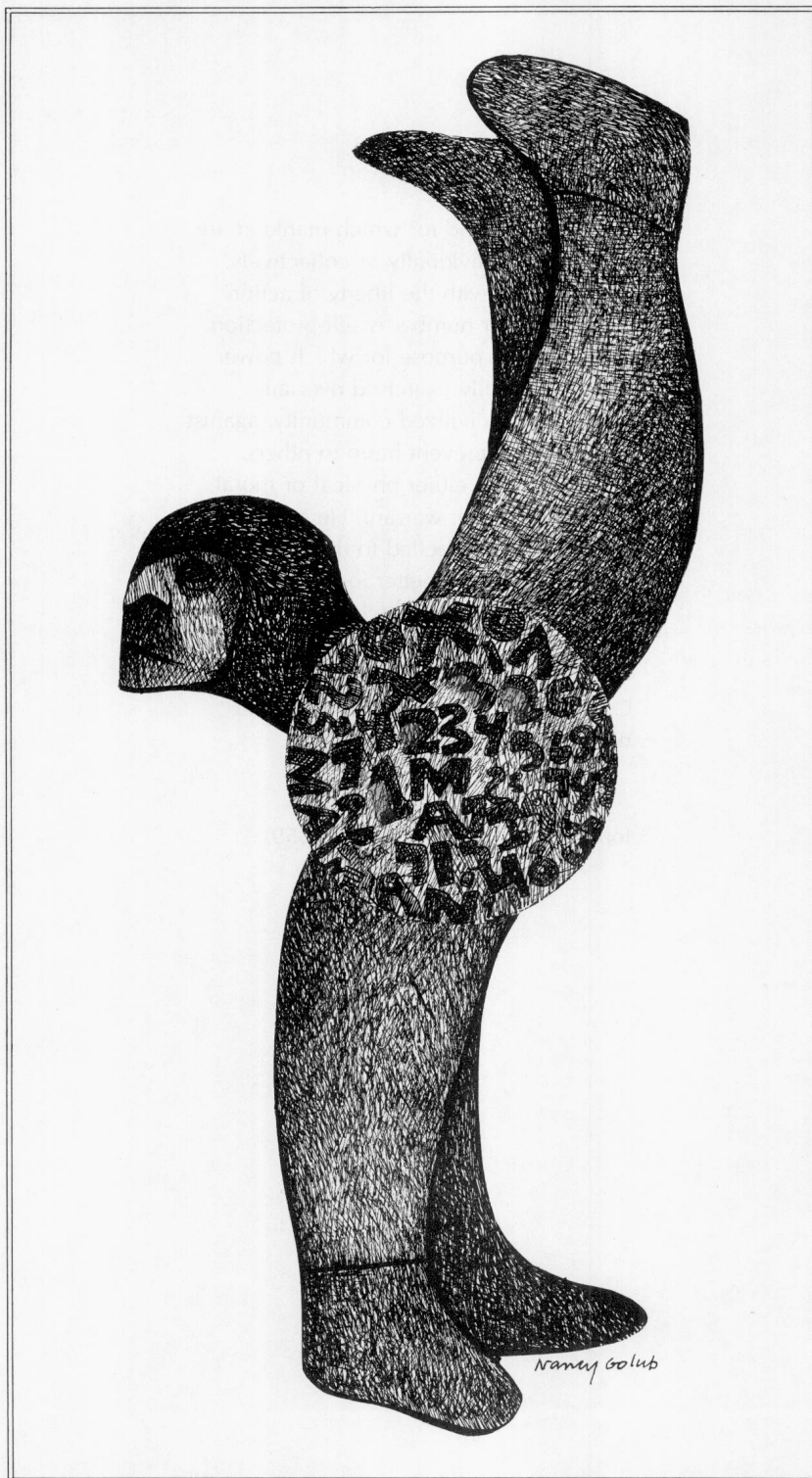
The basic conflict is between the ideal of individual freedom and the pressing need for planning, order, and security. The public debate over computers in society will be dominated by this issue. The debate is bound to fall under the shadow of unethical practices, unfair computer uses, and disastrous failures that may occur. Just as labor legislation and civil rights legislation had to wait until the subconscious response to unfairness became conscious to a group large enough to be heard, so the average response of awe and suspicion toward computers will have to crystallize before laws are enacted. When this crystallization takes place, will it be to thwart the useful as well as the dan-

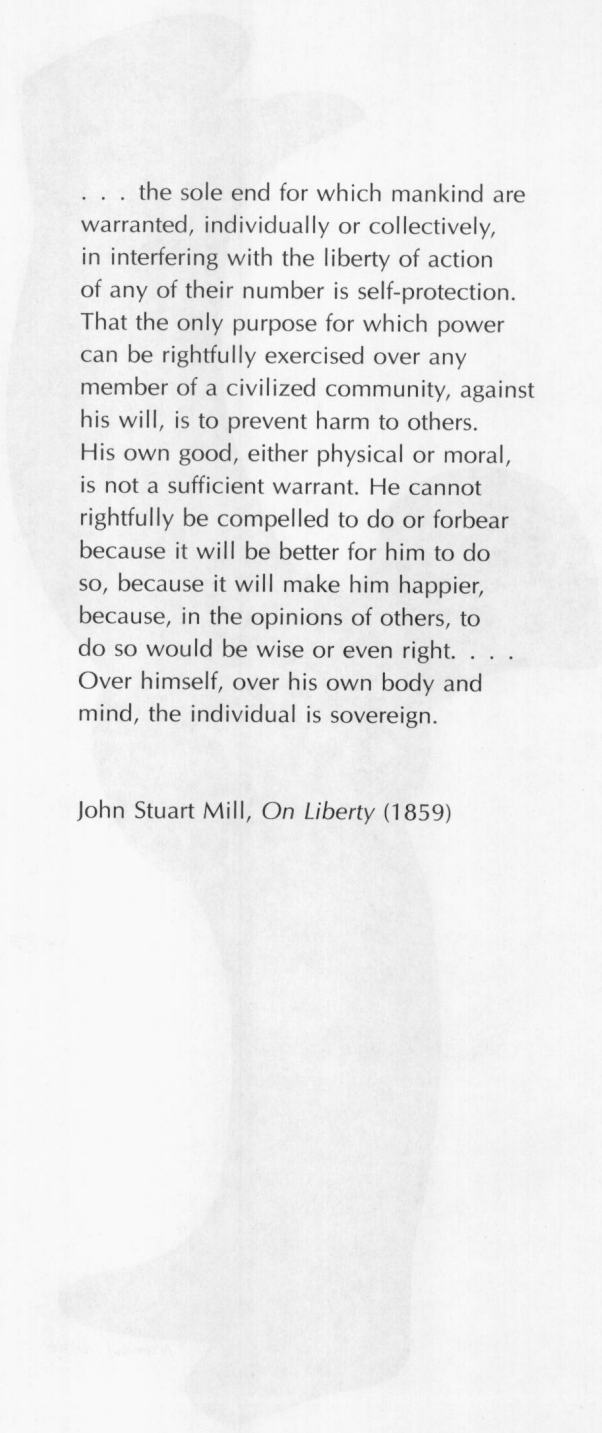
gerous? Will it stop the petty infractions and allow the grand conspiracies to act freely? We do not know the answers to these questions; we do know that no good can come from a situation in which everyone relies on someone else to understand the problem.

The authors wish to make a general acknowledgement to all of those who read and commented on the text, providing advice and counsel that we did not always have the good sense to take. Janet Rothman and Jane Mosmann contributed in numberless ways, not least by their patience. Janet also contributed significantly to the research by gathering materials from obscure sources. Miss Christine Sorrentino patiently typed and retyped. Special thanks are due to Paul Armer, the Harvard Program on Technology and Society; Marilyn Bohl, IBM; Carl Grame, DeAnza College; Frank Holden, San Francisco City College; William Lane, Chico State College; Dan O'Donnell, DeAnza College; Eric A. Weiss, Sun Oil Company; William Viavant, University of Utah, and Michael Duggan, University of Texas. Parts of this book are based on a course given at the University of California at Irvine; we also want to express our gratitude to the students who sat through some rather imperfect drafts and whose insights and enthusiasm helped improve and enlighten the text.

PART I

WHY STUDY COMPUTERS ?





. . . the sole end for which mankind are warranted, individually or collectively, in interfering with the liberty of action of any of their number is self-protection. That the only purpose for which power can be rightfully exercised over any member of a civilized community, against his will, is to prevent harm to others. His own good, either physical or moral, is not a sufficient warrant. He cannot rightfully be compelled to do or forbear because it will be better for him to do so, because it will make him happier, because, in the opinions of others, to do so would be wise or even right. . . . Over himself, over his own body and mind, the individual is sovereign.

John Stuart Mill, *On Liberty* (1859)



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CHAPTER 1

A POINT OF VIEW

Our society is in the midst of a debate to determine whether technology can be controlled and directed toward the achievement of sound goals and the betterment of man or whether its path must lead to the restriction and destruction of human liberty. In no field has this choice been viewed with more alarm than in the development and use of the modern electronic digital computer.

The computer has emerged as one of the most revolutionary inventions of this century. Hardly two decades old, its potential is so little explored that its full impact and the scope of its application cannot be foreseen. In the next few decades, government and industrial leaders, workers in computer-related fields, and ordinary citizens must decide some very new and very complex issues

about this invention. We have intended this book as a primer to bring together some of the materials needed to start answering these new questions. If technology is to be mastered and these questions answered, some dangerous attitudes must change.

"Computers are complicated machines for doing arithmetic and logic. They are the business of scientists and engineers. The rest of us do not have the background or responsibility to worry about what they are and how they should be used."

Many people have used this argument or one like it to avoid a subject they imagine to be too dull or too difficult. Unfortunately, they are wrong.

"If I had access to the computers that keep police records, voting records, tax and property information, I could keep my boss in office forever."

With this statement, the aide to the mayor of a large city neatly illustrated the flaw in the argument: some technical facts have social consequences. If what he said is true, information about what goes on in computers should concern large numbers of people who now consider them no more than technological artifacts.

The impact of computers on the social structure is complex and many-sided. As the quotation above illustrates, the computer has become an important and powerful tool for collecting, recording, analyzing, and distributing tremendous masses of information. At the same time, such power and information can be misused in ways that demand social rather than technical judgment.

The computer has further social impact. It saves countless years of tedious work by clerks, administrators, technicians, and scientists. But in automating work formerly performed by hand, it may be viewed by some people as a threat to their jobs. The computer removes the necessity for men to monitor and control tedious and repetitive processes; but this may be viewed as an abdication of human control. The computer allows us to do things that were impossible without it; but by doing them, we come to be dependent on the machines. Each technical fact about computers seems to have two faces when seen in the light of social implications: the bright and the dark, the advantages and the disadvantages, the valuable and the menacing. How can we tell which is which? How can we get the value and control or eliminate the danger? These are the questions that should concern all of us. They are not solely the responsibility of the technicians and the scientists in our society. They are what this book is about.

Today, computers are nearly everywhere. They recorded your birth and hospital records. When you started school, they recorded your grades and assigned you to classes. When you got a job, they calculated your salary and wrote your paycheck. They compute your taxes and balance your bank account. Your bills—from utilities and oil companies, from doctors and

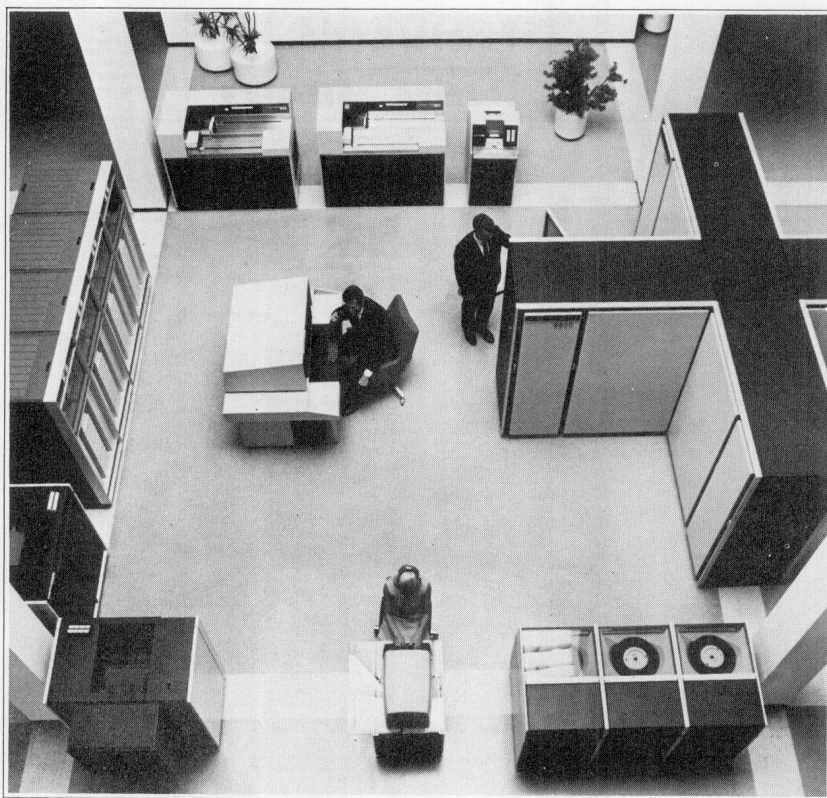


Fig. 1-1. A typical computer center

department stores, insurance companies, credit and loan agencies—are compiled by computer. Your name is on file already in computers in Washington, in the state capital, and (unless you live in a very small town) in city hall. If you have ever had a job, if you have borrowed money or opened a charge account, bank and credit reference agencies across the country may have your name and number in their files.

Computers have created a new industry that employs hundreds of thousands of people. Walk past office buildings late at night and you will find lights from the computer centers reflected in the dark streets. The 12-to-8 shift is working. Or drive past a new commercial development in almost any large city and see the mini-skyscrapers with the word *computer* over their doors. Or glance at the ads in the Sunday paper and note the space devoted to computer schools, programmers wanted, computer dating services. Look at the number of companies in this fast-growing field (Figure 1-2); only a handful existed ten years ago.