Adieu and Welcome

With this issue my term as Book Reviews editor expires. As the founding editor of this department in Computer some 13 years ago, I have enjoyed developing this service with the assistance of all of you excellent friends out there, to whom I would like to acknowledge my grateful thanks for your expert contributions and loyal support. I welcome my successor, new editorial board member Wiley McKinzie. I am sure he will value your support, suggestions, and comments as I did.

Frank P. Mathur

Misunderstanding Media

Brian Winston (Harvard University Press, Cambridge, Mass., 1986, 419 pp., $22.50)

We hope to learn how to do great things ourselves by finding out how great things were done in the past. We hope that some understanding of the history of the development of the electronic wonders of our age will help us. To this end, historians, scientists, and some of those who actually participated in the inventions and developments of the recent past have published their studies and their memoirs and have sometimes suggested theoretical models of how technological development proceeds. Much of this material is careful, accurate, dependable, and useful, but sometimes a seriously flawed work of this genre appears. This is such a book, unfortunately published by the press of our oldest university.

The author, the dean of the school of communications at Pennsylvania State University, has a background in journalism and the performing, or show business, side of British television. His exposure to that jungle led him to a disenchantment with the gadgetry of electronic communications and information processing and a distrust of the commercial hype about the wonders of the technological revolution. He made a detailed study of the history of the development of the interlocked and interrelated spawn of electronics and concluded that

The major underlying assertions of the "information" revolution—increased information, increased pace of change, structured industrial innovation—are no more sustainable than its detailed surface arguments. The flood of information is less significant than is claimed, the pace of change has not increased, the nature of innovation is unchanged.

Furthermore, he developed his own unique model of how technological development takes place, starting with scientific competence and ending with the marketing of products. An essential element of his model is his "law" of the suppression of radical potential, which states that new technologies are introduced into society only insofar as their disruptive potential is contained. To paraphrase, his book is his argument for his model and his "law" and his justification for his attack on what he says is the fraudulent concept of an information revolution. Most of the text are detailed recitations of the histories of the telephone, television, computers, transistors, and satellites—histories that are all forced into the Procrustean bed of his model and all of which he claims support his "law."

Much of his historical story is correct, for he has liberally used the published literature. In particular, he makes a contribution to better understanding of technological development by showing that technology does not always follow science, the reverse order being frequent. But his lack of hands-on familiarity with the history he recites and his ideological commitment to his model and its essential "law" leads him to ascribe all developmental delays to interference by big business and its lackey government agents. He appears to be oblivious to the technological problems that seemed almost insurmountable at the time but that he, with hindsight, now sees to be easily solvable. His neglect of these difficulties seems to be sometimes deliberate but is often merely the consequence of the fact that they are often ignored or de-emphasized in his documentary sources. However, his analysis of historical events in the light of what is now known was going to happen classifies his work as a "Whig" history, that is, a historical account that is deliberately shaped and interpreted to prove an ideological point.

Examples abound in all his histories. Here is one. To explain why computer development was not lightning fast right after the development of Eniac, Winston first asserts that the "von Neumann constant," a jocular explanation of why early computer projects were always late, is an example of the author's "law" of the suppression of radical potential. Then he writes,

The only technological question mark over the nascent computer was the form of its memory, crucial since this was the device's distinguishing characteristic. Although nobody had yet used them for this purpose, Eckert's mercury lines were to hand and were found, eventually, to work as planned; so these cannot have been a source of
Introduction to Data Management and File Design

R. Kenneth Walter (Prentice-Hall, Englewood Cliffs, N.J., 1986, $27.95)

This is a lower-division text in data organization and data access techniques. It is intended, according to the author, for students who have had a course in the concepts of computer hardware and software and are acquainted with a programming language. The author encourages its use for the second course in computing of the ACM Curriculum Committee on Information Systems (CACM, Vol. 25, No. 11, 1982, pp. 781-805).

Because it is intended for use with students of limited background, the text contains much material that many instructors will prefer to have in other courses, as well as material they will be grateful to have in this book. I hope my own students know what an operating system is, how to convert decimal to hexadecimal and vice versa, and how to use lists and queues and stacks, before they take this course. Many of my students haven't seen punched cards, paper and magnetic tape, drums, or enough about disks to be helpful. If one had to work through all of these topics with a class, a year might not be enough. If a class knows all of this, there is still plenty of material here for a semester—disk formats, hashing, partitioned and indexed file organizations, space allocations and catalogs, brief introductions to channels, controls, database management systems terminology, and so on. There is a fairly large assortment of elementary data structures subroutines provided—in pseudocode and Basic, which suggests the low level at which the book is pitched. There are enough exercises, with some answers, and pitched at about the sophomore level. There are few exercises appropriate for advanced majors, or open-ended questions. The inclusion of much elementary material may make this a better-motivated self-study text for some working engineers than, say, a comparably elementary data structures text. This reviewer sometimes teaches an upper-division file management course in which the students have such a mixed background that having all the elementary prerequisites in the book for those who need them is useful—but then supplementary material (B-trees, more on database management, advanced exercises) must be added.

Two defects in this book are fairly common in many other lower-division texts. First, little indication is given to the student of what comes next—what is left to learn. For example, a chapter on sorting of under 20 pages can't say very much about sorting, but it could include a page or two on how terribly important sorting is (how much real-world computer time is devoted to it) and provide some indications of further problems that the student may face later and where she may look for answers. The brevity of the chapter on database management is particularly distressing, because it doesn't adequately warn the person doing file management of how much about database management she ought to know.

Second, there is a real lack of motivating real-world examples ("war stories") on a nontrivial scale. Finding that a certain task can be done in 55 microseconds this way or 37 microseconds that way is a nice exercise: but how do you examine a real-world problem to determine if it is worth doing such an analysis, how much might be saved, what would it cost to save it, is it worth doing? In many practical cases, experimentation is faster and easier than analysis—but no suggestion is made as to how to do this. When this reviewer has taught the course, an early assignment has been something like

In any available language on any available machine: (a) write to disk and read back 1000 records of 50 characters each; (b) change the blocking, record length, et cetera, by whatever means are available, to transfer the 50,000 characters in some faster way. Time all ways tried.

The students complain about the vague-ness of the assignment, but usually get (b) to run in one-half to one-sixth the time of (a), even without understanding how they did it. This provides powerful motivation later in the course, and similar experiments, followed by discussions of when to try them ("on the job") later, have been a popular feature of the course.

A nice book for a low-level file-processing course or for self-study—if used in conjunction with supplementary material.

Edward T. Ordman
Memphis State University
Portraits of Success: Impressions of Silicon Valley Pioneers

Carolyn Caddes (Tioga Publishing Co., Palo Alto, Calif., 1986, 138 pp., $45)

If you're like me, you're intrigued by learning a bit about the personalities that go with the famous names: Who are those people who created the combination of technology, geography, and state of mind that since the mid-1970's has been indelibly branded as Silicon Valley? One way to find out—and a pleasant way at that—is to look through this handsomely produced book by photographer/author Carolyn Caddes.

Portraits of Success is a photographic album of 62 "brilliant inventors, visionary entrepreneurs, and venture capitalists" who have played a large role in shaping the modern phenomenon of Silicon Valley. All the giants are there: Fred Terman, the Stanford University leader who by common consent merits the sobriquet "Father of Silicon Valley"; Hewlett and Packard, perhaps his most illustrious proteges; William Shockley, who, after co-inventing the transistor, founded the first semiconductor company; and many more. Although ardent partisans may quibble with the inclusion or exclusion of specific individuals, there can be no doubt that the selections merit the title.

Each black-and-white photograph is accompanied by a brief biographical sketch that provides a bit of insight into the man (and one woman—Sandra Kurtzig of ASK Computer Systems) behind the picture. At least as interesting to me, Caddes describes her interaction with each person: for example, how she badgered them into submitting to a sitting, and how they reacted to her and her mountain of equipment when she arrived.

Readers of this magazine will be pleased to note that the field of artificial intelligence, and modern computer science more generally, is well represented. John McCarthy and Ed Feigenbaum are there, as are Don Knuth, Alan Kay, and Doug Engelbart. Along with the technologists, the book includes a section containing some of the venture capitalists, investment lawyers, public relations specialists, and, yes, headhunters, who have been instrumental in the development of the valley. Readers might be especially curious to discover more about this group of personalities, so often mentioned in the abstract but not widely known outside of business circles.

Caddes invited each subject to be photographed in a setting that felt most comfortable, and this has created a refreshing diversity in the uniformly high-quality portraits. Standard business uniforms are well-represented, to be sure, but we also see Sheldon Briener of Syntelligence—a marathon competitor—in his jogging shoes, Jimmy Treybig of Tandem Computers at his ham radio, John Young of Hewlett-Packard at his kitchen table, and Jerry Sanders of Advanced Micro Devices perched on a bed whose ostentatiousness might make Hugh Hefner blush. Choosing a favorite portrait in this collection is tough, but for me the pictures of greatest historical interest show the group that became famous as the Fairchild Eight as they were in 1959 and again in the same pose in 1985.

The biographical vignettes bring out certain recurring themes. It is hardly surprising to learn that software specialists Kay and Knuth are accomplished musicians, or that any number of entrepreneurs "keep score with money." But perhaps the most prevalent theme is that for many of these hard-working, successful individuals, work is play; I like that thought the best.

Peter E. Hart

Spreadsheet Applications in Financial Accounting

Angelo E. DiAntonio (Prentice-Hall, Englewood Cliffs, N. J., 1986, 391 pp., $17.95)

The use of information technology in the collegiate curriculum offers exciting possibilities. With the decrease in unit cost and the increase in capability, computer use has become more and more common for instructional purposes. In particular, certain instructional areas have already begun to use information technology as a pedagogical device. The introduction of existing "productive" software (i.e., wordprocessing, spreadsheet analysis, and data analysis) in course work. Computer-augmented practices in existing curricula can offer novel ways of viewing course content/concepts, providing a new educational medium for instructors. The movement toward increased student access to instructional computing corresponds to an effort to develop materials that provide instructors with support for instructional activities. The form these materials take varies widely, but the availability of these materials is essential, if we are to realize the potential of a partnership between information technology and instruction.

The book under consideration falls far short of demonstrating the potential of enriching instruction in financial accounting through the use of spreadsheet and information technology. Though the preface of the text would lead you to believe that the author has captured the essential attributes of spreadsheet software in the context of finance, the techniques and problems presented are not representative of interesting or powerful uses of the software. The book is merely a workbook, to be used in conjunction with any textbook in financial accounting, from which the student (or learner) types in a template the author has prepared (complete with cell references), enters values given by the author, and compares the results with those provided. To trivialize the matter, the author gives additional sets of values (reaching 25 in number) that can be entered and the result checked against solutions in the book.

Spreadsheet software used in educational practice has the potential to allow learners to explore the intricacies of quantitative decision making and sensitivity analysis, both of which are important in financial accounting. Yet this application software, as portrayed in DiAntonio's book, provides nothing more than minimal calculating capacity. Though the coverage of financial accounting problems may be thorough, this model for this area in collegiate curricula is inadequate. American education in the 1980's and 1990's does not need another "cookbook" approach to learning; it does not need to produce additional college graduates who are not skilled in the sophistication of problem solving and solution interpretation. We need instructional material that captures the power and elegance of computing for problem solving, not trivialization of intellectual activity.

Richard L. Upchurch
Southeastern Massachusetts University

May 1987