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RICHARD E. MERWIN 1922-1981 (p. 3) “Dick Merwin was one of those unique men who always seemed able to balance the rigors of a technical discipline and the demands of his profession on the one hand against the gentler but deeper claims of a full, rich personal life on the other.”

INTEGER DIVISION (p. 10) “Even those who are interested in integers—mathematicians in number theory—care little about the remainder (other than whether it is 0) and pretty much ignore negative integers. But now that attention is being paid to it, it is time to correct integer division.”

PROGRAM DESIGN (p. 13) “Much as a building architect specifies the structure and construction of a building ..., the software architect must specify the structure and construction of a program. This guided tour examines some of the concepts, techniques, and methodologies that can aid in this task.”

COMPUTING IN CHINA (p. 39) “This article ... provides an overview of the state of computing in China in September of 1980.”

ENDIANS (p. 49) “What is the proper byte order in messages? More specifically, the question is, Which bit should travel first—the bit from the little end of the word or the bit from the big end of the word?”

DESIGN AUTOMATION (p. 58) “During 1978-79 we carried out an intensive study of the status of industrial and governmental design automation systems applied to digital systems, with primary emphasis on digital cards and LSI circuits. In this article we present some of the study’s more significant data and conclusions.”

TECHNICAL EDUCATION (p. 76) “The continuing education program in applied computer science described in this article is a technical curriculum developed and executed to meet both industrial needs and high academic standards. Among its goals are effective design and implementation of software systems and related issues of software and programmer productivity.”

MICROPROGRAMMING (p. 81) “How can the performance of systems containing obsolete technology be improved? Emulation and microprogramming provide cost-effective answers for real-time applications in a process control environment.”

TUTORIAL (p. 93) “… it has been and continues to be most cost-effective to have a hierarchy of memories with the smallest, shortest-access-time memory located physically close to the processor and larger, slower ones farther away on buses or channels.”

COMPUTER PACKAGING (p. 111) “The schools do a good job on silicon integrated circuit design, he added, but no comparable education is provided to the engineering of the rest of the system—the portion that determines the major share of the manufacturing cost.”

CREDIT CARDS (p. 124) “Researchers at Battelle Memorial Institute in Columbus, Ohio, are engaged in a six-month international study that is examining the future of plastic credit cards with built-in microprocessors and memories.”

ERGONOMICS (p. 127) “Half a dozen video workstation ergonomic standards are already in effect in West Germany and are influencing the rest of Europe. United States manufacturers are scrambling to meet their requirements in order to continue to sell overseas.”

PRIVACY (p. 135) “Our natural desire to be treated as individuals, according to our unique circumstances, contributes to the need of bureaucracies for more and more personal data. This approach, hardly ever questioned, can be changed by finding alternatives that are less information-intensive.”

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URLS (p. 6) “How do we assess the reliability and correctness of information that appears on a Web page? What hidden assumptions do the authors of Web pages make, and how does this affect the information provided?”

BANDWIDTH (p. 14) “Researchers say DWDM [dense wavelength-division multiplexing] could help quench the world’s increasing thirst for bandwidth. DWDM increases the number of communication channels within a fiber-optic cable, thereby letting service providers obtain much more bandwidth without installing expensive new cable.”

INTERNET APPLIANCES (p. 16) “Now the standardization of Internet protocols and competition among ISPs have driven down the price of Internet connectivity, so vendors are beginning to incorporate it into a wide range of devices.”
In addition, low-cost communications technologies, such as wireless, promise to let users connect these devices inexpensively to intranets.

Y2000 (p. 22) “Companies trying to cope with Year 2000 problems may have more to worry about than they originally anticipated. Any appliance or system that uses an embedded clock chip—coffee makers, VCRs, oil pipelines, building alarms, traffic lights, and so on—could be susceptible to the problem. Dallas Semiconductor, which manufactured the first Year-2000-compatible clock chips in 1992, said billions of devices could be affected. They include mission-critical devices and those that involve public safety.”

BIOMETRY (p. 25) “Developers are designing biometric security devices that recognize authorized computer users by their fingerprints, facial features, voice patterns, and other personal characteristics, rather than by passwords.”

REUSE (p. 36) “Reuse technology is ready now. In fact, enough companies have demonstrated substantial improvement, often as much as 90 percent reuse, to assure us that it can be achieved.”

OBJECT REUSE (p. 43) “Many organizations, both public and private, are either planning to invest or have already invested large sums of money and time into software reuse. Unfortunately, software reuse has proven difficult to achieve. Organizations attempting to implement a software reuse program face both technical and non-technical problems.”

CASE STUDIES (p. 47) “In 1992, we initiated four case studies of early OO adopters, which we continued until 1996. These longitudinal case studies gave us a richer description of the actual challenges early adopters faced and helped us develop recommendations about how organizations can succeed with adoption in spite of potential barriers. Our results are particularly significant because longitudinal case studies avoid the inevitable bias of most case studies, in which results are analyzed retrospectively.”

FAST WORK (p. 60) “Rapid application development (RAD) programmers reuse screen, table, report, and other supplied parent objects whose range of methods and attributes has been engineered by development tool manufacturers. These central business objects are examples of what I call RAD-Business-Objects that are native to the chosen tool and designed by the tool manufacturer.”

FINDING OBJECTS (p. 66) “Much object-oriented code has been written without reuse in mind, making identification of useful components difficult. The Patricia system automatically identifies these components through understanding comments and identifiers.”

DESCRIBING OBJECTS (p. 73) “The COOR environment exploits the advantages of OO code to promote software reuse, performing classification and analysis using a Software Descriptor method based on a fuzzy query language for component retrieval. Fuzzy weighting mechanisms highlight relevant features of components for reuse in specific industrial application domains.”

TECHNICAL ACTIVITIES (p. 84) “A large number of professionals active in computing work in fields that are not directly related to computer science. These professionals more often than not display an ease and understanding in the application of computing skills to their discipline that is as great or greater than that of scientists trained in computer science alone.”

ETHICS (p. 88) “The purpose of the Software Engineering Ethics and Professional Practices task force is to document the ethical and professional responsibilities and obligations of software engineers. This draft code of ethics was developed by a task force of the Joint IEEE Computer Society and Association for Computing Machinery Steering Committee for the Establishment of Software Engineering as a Profession and has been reviewed by the Steering Committee.”

DOCUMENTATION (p. 97) “While there is no universally recognized standard for software documentation, there is a standard for documenting engineering and scientific software. ... The standard is not a rigid set of specifications, but a guide that can apply to most software projects intended for internal or external use.”

TRUSTY METHODS (p. 121) “Trust is a quirky—but very important—factor in human relations. We need to learn to trust our co-workers and our processes. Rejecting a method simply because you haven’t tried it doesn’t strike me as very effective.”

THE INTERNET (p. 122) “We need a high-speed, congestion-free, always reliable, friction-free, packet-switched, big-bandwidth, data-friendly network that is universally available, competitively priced, and capable of driving the American economy to new heights.”

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