sider also his comments on the value of information about information. Once you have bits that tell you about bits, such as the header information in a video feed, then new opportunities are presented for intelligent management of large data sets.

As did Marshall McLuhan, Negroponte thinks deeply about communications and its devices. The difference is the firmness with which his feet are planted on the solid ground of real technology. For instance, take Negroponte's striking dissection of the fax machine—a device many believe to be the wonder appliance of the workplace. Yet the fax machine makes documents (and therefore ourselves) more stupid by converting carefully crafted info-rich word-processed text into dumb dots on a page. Of course the fax machine is a convenient paper mover, but one that we pay for dearly when we could be storing and transmitting intelligent documents that "know" about themselves. On this and many other topics, Negroponte's digital vision may not be to all tastes, but it is likely to be closest to what lies ahead.

David Voss

Vignettes: Using Math

The majority of the population avoids mathematics like herpes. But math is really good stuff. With algebra you can figure out how much sugar you need in chocolate mousse for eleven when you have a recipe for six. With calculus you can calculate how much you'll have for college in thirteen years, five months if you save $117.60 a month at 3.62 percent.

—*Thomas K. Landauer*, in *The Trouble with Computers: Usefulness, Usability, and Productivity* (MIT Press)

Mathematics is after all only a concise shorthand description of the world, and if a position-finding calculation based, say, on trigonometry and stellar observations, gives two results, equally valid, that you are either in Greenland or Barbados, you are entitled to discard one of the solutions if it is snowing outside.

—*J. F. James*, in *A Student's Guide to Fourier Transforms, with Applications in Physics and Engineering* (Cambridge University Press)

Other Books of Interest

Fullerene Research, 1985–1993. A Computer-Generated Cross-Indexed Bibliography of the Journal Literature. T. BRAUN, A. SCHUBERT, H. MACZELKA, and L. VASVÁRI. World Scientific, River Edge, NJ, 1995. vi, 473 pp. $93 or £64. Advanced Series in Fullerenes; vol. 3.

This work, emanating from the library of the Hungarian Academy of Sciences, is a compilation of over 3000 references to journal articles published between 1985 and 1993 on the now famous carbon-cage molecules named after Buckminster Fuller. The main entries (occupying 183 pages) are grouped according to journal and then chronologically, with a numbering system that assigns A-1 to the first entry (one of 13 from *Accounts of Chemical Research*) and proceeds through the alphabet to Z-67, the one paper listed from *Zhurnal fizicheskoi khimii*. This is followed by an author index, a nation-by-nation index of authors' institutions, and a "partially permuted title word index" that occupies 216 pages. The format of the work facilitates the making of counts, and the compilers present the results of some such efforts in a section of tables and charts at the end. One learns, for instance, that the number of papers on fullerenes grew from 4 in 1985 to 1400 in 1993 and that *Chemical Physics Letters* and *Physical Review B* have published the most, with *Nature* and *Science* accounting for 118 and 100, respectively. There are 50 authors whose names have appeared on 20 or more papers, the most productive being Y. Achiba. Of the 42 nations contributing to the field, the United States accounts for the largest number of papers (1406), with Japan, Germany, the United Kingdom, France, and Russia each having three-digit totals. To assess the comprehensiveness of the work would be perhaps a larger project than its compilation, but one hopeful indicator is that it even includes book reviews. Continuations are planned.

Katherine Livingston

Turbulence. A Tentative Dictionary. P. TABELING and O. CARDOSO, Eds. Plenum, New York, 1995. xii, 149 pp., illus. $65. NATO ASI Series B, vol. 341. Special Program on Chaos, Order, and Patterns. Based on an institute, Cargèse, France.

In their preface the editors of this volume note that students excited by the idea of churning flows or violent jet streams soon find themselves faced with high-order structure functions of velocity increments or spectra of the enstrophy. Acknowledging that such terms are not only long and technical but "poorly evocative," Tabeling, Cardoso, and other participants in a recent conference on turbulence have set out to provide, in lieu of the usual sort of proceedings volume, a work that will explain the meanings of some key concepts in the field. The result is more akin to an encyclopedia than to a dictionary, with discursive entries several pages in length. One purpose of the meeting from which the work derives was to consider both fully developed turbulence (in two and three dimensions) and weak turbulence (one- and two-dimensional systems), and this is reflected in the coverage. In all there are 23 entries, dealing with decaying two-dimensional turbulence, experiments on 1D and 2D turbulence and spatiotemporal chaos, extended self-similarity, hot-wire anemometry, intermittency, numerical simulations, optical and phase turbulence, predictability, probability density functions, Rayleigh-Bénard turbulent convection, scaling in hydrodynamics, shear flows, shell models, singularities, spatiotemporal intermittency, the statistical approach, structure functions, vorticity filaments, and wavelet analysis. Each entry has its own bibliography, and the book includes a subject index. Some flaws in the editing might be noted: the English is not always smooth, and there are inconsistencies in the information given about the Cargèse conference.

Katherine Livingston

Publishers' Addresses

Below is information about how to direct orders for books reviewed in this issue. A fuller list of addresses of publishers represented in *Science* appears in the issue of 26 May 1995, page 1220.

Alfred A. Knopf, Inc., Westminster Distribution Center, 400 Hahn Rd., Westminster, MD 21157. Phone: 800-733-3000; 410-848-1900. Fax: 800-659-2436; 410-386-7013.

Plenum Publishing Corp., 233 Spring St., New York, NY 10013–1578. Phone: 800-221-9369; 212-620-8000. Fax: 212-463-0742.

University Press of Florida, 15 NW 15th St., Gainesville, FL 32611. Phone: 800-226-3822; 904-392-1351. Fax: 904-392-7302.

World Scientific Publishing Co., 1060 Main St., River Edge, NJ 07661. Phone: 800-227-7562; 201-487-9655. Fax: 201-487-9656.