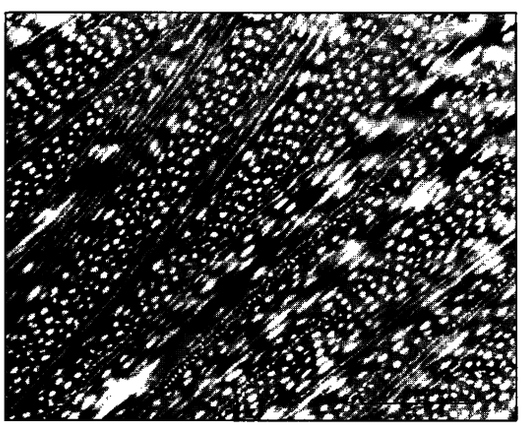
that these materials play a more dynamic part in developmental biology than is generally appreciated. For instance, the net orientation of cellulose fibers in the cell wall of a plant controls the direction in which the cell will expand, so it is at this level that we have to explore the control of shape of the plant in growth (both at the meristem and an increasing size) and wound healing. This adaptation of directional properties applies to insects in all stages, egg to adult; to cysts and egg capsules of a huge variety of animals; to silk; and to nutshells and to bone. We still do not know how the orientations are achieved or controlled, but with such a wide variety of materials and mixtures capable of self-assembly, there is likely to be a variety of mechanisms. Neville devotes a chapter to this problem and recognizes two main classes—remote (chemical) control and more immediate directed control, where cellular structures can be seen to match with those of the extracellular material. A further possibility is mechanical orientation. The chapter on biomimicry interestingly introduces more artificial liquid crystalline materials but regrettably says little about how they might be used.

There are a few elementary mistakes, such as the generalizations that all mammalian bone is osteate, that the roots of plants carry virtually no stresses, that glass fibers are brittle because they have small scratches on the surface, and that the high resilience of resilin can only be due to the randomness of arrangement of its constituent chains. These errors do not reduce the impact of the work, which is full of insight. For instance, only with the evolution of cell walls made with fibers ordered in such a way as to support large forces can plants have developed sufficient rigidity to support themselves and become large. Can one see these orientations in the petrified cell walls of *Rhynia*, that famous first land plant? As usual, Neville is generous with his ideas and produces blueprints for a dozen or so projects, some to be pursued in well-known holiday resorts. This book is such a good read that I wouldn't mind taking it along too.



"Transmission electron micrograph of a section through the eggcase protein of a praying mantis (*Sphodromantis tenuidentata*). This was fixed *in situ* in the oothecal gland and was in a liquid crystalline phase prior to fixation. The system is seen to be orthogonal. From work by B. M. Luke and A. C. Neville. Stained with uranyl acetate and lead citrate." [From *Biology of Fibrous Composites*]

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Other Books of Interest

Science Advice to the President. WILLIAM T. GOLDEN, Ed. Second edition. AAAS Press, Washington, DC, 1993. xii, 329 pp. Paper, $29.95; to AAAS members, $23.95.

Science and Technology Advice to the President, Congress and Judiciary. WILLIAM T. GOLDEN, Ed. Second edition. AAAS Press, Washington, DC, 1993. xxiv, 529 pp. Paper, $29.95; to AAAS members, $23.95.

The efforts of William Golden in the years just after the Second World War were instrumental in establishing a mechanism for science advice to the U.S. presidency that has continued, with various interruptions and modifications, to the present day. In 1980 Golden brought together under the title *Science Advice to the President* (Pergamon Press) a collection of observations and reflections by those who had served as presidential science advisers and by other knowledgeable commentators (see *Science* **209**, 371 [1980]). This was followed by two further compendia expanding the scope of the coverage: *Science and Technology Advice to the President, Congress, and Judiciary* (Pergamon, 1988; see *Science* **239**, 1077 and 1082, and **240**, 1552 [1988]) and *Worldwide Science and Technology Advice to the Highest Levels of Government* (Pergamon, 1991; see *Science* **252**, 1565 [1991]). The first two of these works have now been reissued, reprinting without change the contents of the original versions but with new prefatory material and some additions to cover more recent developments.

The principal additions to *Science Advice to the President* are contributions from the two most recent presidential advisers, John H. Gibbons and D. Allan Bromley. Gibbons proffers four pages on "President Clinton's first 100 days," optimistic in tone but "draw[ing] few conclusions from [his] experience to date." Bromley, who served in the Bush administration, provides an essay of some 40 pages (a harbinger of his book-length memoirs soon to be published under the title *The President's Scientists* by Yale University Press) in which he comments on issues ranging from office location and personnel recruitment through earmarking, science and mathematics education, "critical technologies" enterprises, environmental affairs (especially the Nordwijk and Rio conferences), and international issues related to science and technology. He also provides a list of key figures of the Bush-era science apparatus. In addition to the contributions by Gibbons and Bromley, John McTague, who served briefly under Reagan, provides a few paragraphs on events of his tenure.

In the new version of *Science and Technology Advice* the original 85 articles are augmented by an account of the efforts of the Carnegie Commission on Science, Technology, and Government (1988–1993), of which Golden, with Joshua Lederberg, was co-chairman. The commission focused its analysis on the decision-making apparatus rather than specific policy issues, and in a chapter added at the end of the book Golden lists the categories of organizations examined, summarizes activities focused on the three branches of the federal government and state governments, names members and other associates of the commission, and lists publications resulting from its activities. As does its companion volume, the book has a name but not a subject index.

—Katherine Livingston

A Positron Named Priscilla. Scientific Discovery at the Frontier. MARCIA BARTUSIAK and eight others. National Academy Press, Washington, DC, 1994. viii, 348 pp., illus., + plates.

This is a book conceived in the spirit—and presumably as an offshoot—of the National Academy of Sciences' "Frontiers of Science" symposiums, which (in the words of Bruce Alberts's foreword) bring together "some of the nation's and the world's top young researchers . . . to report on their current work to peers *outside* their discipline." Here, however, the intended audience is larger—"everyone interested in the course of science"—and the expositors are "top science writers." In the essay that gives the volume its title T. A. Heppenheimer discusses the "trapping and manipulating" of atoms and subatomic particles by optical and magnetic means (Priscilla being a captive of Hans Dehmelt). Heppenheimer also contributes a paper on the top quark and Higgs particle, and Elizabeth Maggio writes about fullerenes. Methods of studying the sun's interior, discoveries due to the Magellan

mission to Venus, and the bases of earthquake prediction are dealt with respectively by Bartusiak, Andrew Chaikin, and Addison Greenwood, and Barbara Burke expounds wavelets. On the biological side are papers by Michelle Hoffman on the "molecular puzzle" of AIDS, Anne Simon Moffat on "how the genetic code replicates itself," and David Holzman on how proteins "fold, spindle, and regulate." An appendix further offers two- to three-page "abstracts" of six sessions of the Frontiers symposiums on topics not represented in the main body of the book, and another gives the programs of the 1991 and 1992 symposiums. In the matter of bibliography, the ten main contributions are variable, one offering as few as three items of "recommended reading" and others sampling the technical as well as the more popular literature of their subjects. The book as such is nicely produced, with generous proportions, clear photographs and drawings, several pages of color plates, and a detailed index.

—*Katherine Livingston*

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Books Received

Acupuncture. How It Works, How It Cures. Peter Firebrace and Sandra Hill. Keats, New Canaan, CT, 1994. 160 pp., illus. Paper, $19.95.

Advanced Abnormal Psychology. Vincent B. Van Hasselt and Michel Hersen, Eds. Plenum, New York, 1994. xiv, 542 pp., illus. $45.

Affect Regulation and the Origin of the Self. The Neurobiology of Emotional Development. Allan N. Schore. Erlbaum, Hillsdale, NJ, 1994. xxxiv, 670 pp., illus. $135.

Basic Concepts in Information Theory and Coding. The Adventures of Secret Agent 00111. Solomon W. Golomb, Robert E. Peile, and Robert A. Scholtz. Plenum, New York, 1994. xii, 431 pp., illus. $59.50. Applications of Communications Theory.

Basic Protein and Peptide Protocols. John M. Walker, Ed. Humana, Totowa, NJ, 1994. xii, 490 pp., illus. $89.50; spiral bound, $59.50. Methods in Molecular Biology, 32.

Basic Relativity. Richard A. Mould. Springer-Verlag, New York, 1994. xiv, 450 pp., illus. $49.95.

Basic Statistics. Tools for Continuous Improvement. Mark J. Kiemele and Stephen R. Schmidt. 3rd ed. Air Academy Press, Colorado Springs, CO, 1994. Variously paged, illus. $59.95.

Can Governments Learn? Comparative Perspectives on Evaluation and Organizational Learning. Frans L. Leeuw, Ray C. Rist, and Richard C. Sonnichsen, Eds. Transaction, New Brunswick, NJ, 1994. viii, 212 pp. $34.95. Comparative Policy Analysis Series.

Cancer from Beef. DES, Federal Food Regulation, and Consumer Confidence. Alan I. Marcus. Johns Hopkins University Press, Baltimore, MD, 1994. xii, 235 pp. $38.50.

Carabid Beetles. Ecology and Evolution. K. Desender *et al.*, Eds. Kluwer, Norwell, MA, 1994. xii, 474 pp., illus. $257 or £174 or Dfl. 435. Series Entomologica, vol. 51. From a symposium, Louvain-la-Neuve and Brussels, Belgium, Sept. 1992.

Crossover. Concepts and Applications in Genetics, Evolution, and Breeding. An Interactive Computer-Based Laboratory Manual. Jack E. Staub. Karl Braunschweig and Claire Rinehart, programmers. University of Wisconsin Press, Madison, 1994. xxiv, 359 pp., illus., + diskette. Spiral bound, $30.

Dictionary of Ceramic Science and Engineering. Ian J. McColm. 2nd ed. Plenum, New York, 1994. xii, 384 pp. $75.

Dinosaur Eggs and Babies. Kenneth Carpenter, Karl F. Hirsch, and John R. Horner, Eds. Cambridge University Press, New York, 1994. xiv, 372 pp., illus. $79.95.

Doctors' Marriages. A Look at the Problems and Their Solutions. Michael F. Myers. 2nd ed. Plenum, New York, 1994. xxvi, 257 pp. $32.50.

Ethics. The Science of Oughtness. Archie J. Bahm. Rodopi, Atlanta, GA, 1994. x, 200 pp., illus. Paper, $35 or Dfl. 60. Value Inquiry Book Series, vol. 8.

Evolution Extended. Biological Debates on the Meaning of Life. Connie Barlow, Ed. MIT Press, Cambridge, MA, 1994. viii, 333 pp., illus. $24.95.

Exotic Ants. Biology, Impact, and Control of Introduced Species. David F. Williams, Ed. Westview, Boulder, CO, 1994. xviii, 332 pp., illus. $74.85. Westview Studies in Insect Biology. Based on a conference, Galapagos Islands, Oct. 1991.

Experimental Mass Spectrometry. David H. Russell, Ed. Plenum, New York, 1994. xiv, 311 pp., illus. $79.50. Topics in Mass Spectrometry, vol. 1.

Fear of Math. How to Get Over It and Get On With Your Life. Claudia Zaslavsky. Rutgers University Press, New Brunswick, NJ, 1994. xii, 264 pp., illus. $37; paper, $14.95.

A Field Guide to the Trees and Shrubs of the Southern Appalachians. Robert E. Swanson. Frances R. Swanson, illustrator. Johns Hopkins University Press, Baltimore, MD, 1994. xiv, 399 pp. $55; paper, $18.95.

Flexible Bodies. Tracking Immunity in American Culture From the Days of Polio to the Age of AIDS. Emily Martin. Beacon, Boston, 1994. xxiv, 320 pp., illus. $25.

The Greening of Industrial Ecosystems. Braden R. Allenby and Deanna J. Richards, Eds. National Academy Press, Washington, DC, 1994. x, 259 pp., illus. $34.95. Based on a workshop, Woods Hole, MA, July 1992.

A Guided Tour of Computer Vision. Vishvjit S. Nalwa. Addison-Wesley, Reading, MA, 1994. xii, 361 pp., illus. $34.95.

Handbook for *Rhizobia*. Methods in Legume-Rhizobium Technology. P. Somasegaran and H. J. Hoben. Springer-Verlag, New York, 1994. xvi, 450 pp., illus. $69. Springer Laboratory.

Handbook of Psycholinguistics. Morton Ann Gernsbacher, Ed. Academic Press, San Diego, CA, 1994. xxii, 1174 pp., illus. $105.

Handbook of Social Cognition. Robert S. Wyer, Jr. and Thomas K. Srull, Eds. 2nd ed. Erlbaum, Hillsdale, NJ, 1994. 2 vols. Vol. 1, Basic Processes. xvi, 466 pp., illus. $90. Vol. 2, Applications. xvi, 514 pp., illus. $95.

Identity. Youth and Crisis. Erik H. Erikson. Norton, New York, 1994. 336 pp. Paper, $8.95. Austen Riggs Monograph no. 7. Reprint, 1968 ed.

In the Eye's Mind. Vision and the Helmholtz-Hering Controversy. R. Steven Turner. Princeton University Press, Princeton, NJ, 1994. xiv, 338 pp., illus. $49.50 or £37.50.

Life, Health and Longevity. The Most Practical Common Sense Discovery in Medical History. Kenneth Seaton. Kenneth M. Kroll, Ed. Scientific Hygiene, Ceredo, WV, 1994. 108 pp., illus. Paper, $9.95.

Logic and Philosophy of Science in Uppsala. Dag Prawitz and Dag Westerstähl, Eds. Kluwer, Norwell, MA, 1994. x, 610 pp., illus. $168.50 or £115 or Dfl. 295. Synthese Library, vol. 236. From a congress, Uppsala, Sweden, 1991.

Low Energy Ion-Surface Interactions. J. Wayne Rabalais, Ed. Wiley, New York, 1994. xiv, 594 pp., illus. $120. Wiley Series in Ion Chemistry and Physics.

Methods in Enzymology. Vol. 232, Hemoglobins. Part C, Biophysical Methods. Johannes Everse, Kim D. Vandegriff and Robert M. Winslow, Eds. Academic Press, San Diego, CA, 1994. xxviii, 725 pp., illus. $99.

Methods in Enzymology. Vol. 235, Bacterial Pathogenesis. Part A, Identification and Regulation of Virulence Factors. Virginia L. Clark and Patrik M. Bavoil, Eds. Academic Press, San Diego, CA, 1994. xxx, 789 pp., illus. $105.

The Myths of August. A Personal Exploration of Our Tragic Cold War Affair with the Atom. Stewart L. Udall. Pantheon, New York, 1994. xii, 399 pp. $25.

Naming Our Ancestors. An Anthology of Hominid Taxonomy. W. Eric Meikle and Sue Taylor Parker. Waveland, Prospect Heights, IL, 1994. x, 254 pp., illus. Paper, $12.95.

Neural Transplantation, CNS Neuronal Injury, and Regeneration. Recent Advances. Joe Marwah, Herman Teitelbaum, and Kedar N. Prasad, Eds. CRC Press, Boca Raton, FL, 1994. xiv, 276 pp., illus. $99.

Next. Young American Writers on the New Generation. Eric Liu, Ed. Norton, New York, 1994. x, 233 pp. $21; paper, $12.95.

Optimization Techniques in Statistics. Jagdish S. Rustagi. Academic Press, San Diego, CA, 1994. xiv, 359 pp. $69.95. Statistical Modeling and Decision Science.

Oxygen Transport to Tissue XV. Peter Vaupel, Rolf Zander, and Duane F. Bruley, Eds. Plenum, New York, 1994. xx, 955 pp., illus. $175. Advances in Experimental Medicine and Biology, vol. 345. From a meeting, Mainz, Germany, Aug. 1992.

Paleonutrition. The Diet and Health of Prehistoric Americans. Kristin D. Sobolik, Ed. Southern Illinois University Center for Archaeological Investigations, Carbondale, IL, 1994. xviii, 321 pp., illus. Paper, $30. Occasional Paper no. 22. From a conference, Carbondale, IL, March 1992.

Quantitative Ecology. Spatial and Temporal Scaling. David C. Schneider. Academic Press, San Diego, CA, 1994. xvi, 395 pp., illus. $49.95.

Random Coefficient Models. Nicholas T. Longford. Clarendon (Oxford University Press), New York, 1994. xiv, 270 pp., illus. $45. Oxford Statistical Science Series, 11.

Real-Time Optical Information Processing. Bahram Javidi and Joseph L. Horner, Eds. Academic Press, San Diego, CA, 1994. x, 536 pp., illus. $99.

Science on the Run. Information Management and Industrial Geophysics at Schlumberger, 1920–1940. Geoffrey C. Bowker. MIT Press, Cambridge, MA, 1994. viii, 191 pp., illus. $27.50. Inside Technology.

Self-Regulation of Learning and Performance. Issues and Educational Applications. Dale H. Schunk and Barry J. Zimmerman, Eds. Erlbaum, Hillsdale, NJ, 1994. xii, 329 pp., illus. $79.95; paper, $29.95.

The Stop AIDS Story 1987–1992. Swiss Aids Foundation and Federal Office of Public Health, Bern-Liebefeld, Switzerland, 1993 (distributor, Aids Info Docu Schweiz, Bern, Switzerland). 108 pp., illus. SwF 10.

Structure Determination by X-Ray Crystallography. M. F. C. Ladd and R. A. Palmer. 3rd ed. Plenum, New York, 1994. xxvi, 586 pp., illus. Paper, $34.50.

Topics in Atomic and Nuclear Collisions. B. Remaud, A. Calboreanu, and V. Zoran, Eds. Plenum, New York, 1994. xiv, 463 pp., illus. $125. NATO Advanced Science Institutes Series B, vol. 321. From an institute, Predeal, Romania, Aug. 1992.

Topics in Nonlinear Dynamics with Computer Algebra. Richard H. Rand. Gordon and Breach, Langhorne, PA, 1994 (distributor, International Publishers Distributor, Langhorne, PA). x, 229 pp., illus. $48 or £31; paper, $22 or £14. Computation in Education, vol. 1.

Toward the Habit of Truth. A Life in Science. Mahlon Hoagland. Norton, New York, 1994. xxx, 206 pp., illus. Paper, $12.95. The Commonwealth Fund Book Program. Reprint, 1990 ed.

Ultrafast Dynamics of Chemical Systems. John D. Simon, Ed. Kluwer, Norwell, MA, 1994. viii, 385 pp., illus. $179 or £118 or Dfl. 295. Understanding Chemical Reactivity, vol. 7.

***Vibrio cholerae* and Cholera**. Molecular to Global Perspectives. I. Kaye Wachsmuth, Paul A. Blake, and Ørjan Olsvik, Eds. ASM Press, Washington, DC, 1994. xii, 465 pp., illus. $72; to ASM members, $59.

Victims of Abuse. The Emotional Impact of Child and Adult Trauma. Alan Sugarman, Ed. International Universities Press, Madison, CT, 1994. xii, 233 pp. $30. Monograph Series of the Ralph R. Greenson Memorial Library of the San Diego Psychoanalytic Society and Institute, Monograph 3.

Waterfowl Ecology and Management. Guy A. Baldassarre and Eric G. Bolen. D. Andrew Saunders, illustrator. Wiley, New York, 1994. xx, 609 pp., illus. $59.95.

Who Owns Information? From Privacy to Public Access. Anne Wells Branscomb. Basic Books, New York, 1994. xiv, 241 pp. $25.