disaster was of a level of personal consequentiality likely to initiate flashbulb memory formation. Yet none of the Challenger flashbulb memory studies, including that by Neisser and Harsch, made any attempt to measure the level of consequentiality of the event for the subjects who took part in the studies. Indeed, the word "consequentiality" does not even appear in the index of *Affect and Accuracy*, even though it is a critical aspect of Brown and Kulik's theory. This key omission calls into question the basic argument running through the book, for if the Challenger disaster was low in personal importance, despite being highly surprising, then according to Brown and Kulik's model the incidence of true flashbulb memories of the event would be low—exactly the finding of many of the Challenger studies. Thus the findings of the symposium participants do not automatically disprove the encoding theory of flashbulb memory formation.

Affect and Accuracy is nevertheless an important book that will be used extensively by researchers concerned with memory in natural circumstances. It contains excellent reviews of the effects of emotion on memory, developmental aspects of flashbulb memories, and the neurobiology of memory and concludes with spirited discussion of methodological and theoretical issues. It is only when the contributors use their findings to discredit Brown and Kulik's theory of flashbulb memory formation that some caution must be exercised. I suggest that the reader keep a copy of Brown and Kulik's original paper close by.

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Quarks Bottom to Top

Heavy Flavours. A. J. BURAS and M. LINDNER, Eds. World Scientific, River Edge, NJ, 1992. xvi, 785 pp., illus. $103 or £73; paper, $58 or £41. Advanced Series on Directions in High Energy Physics, vol. 10.

In 1964 Gell-Mann and Zweig proposed that neutrons and protons were made up of more elementary constituents, which they called "quarks." Remarkably, the denizens of the zoo of "elementary" particles produced by accelerators could be broken down into three basic constituents, which (for lack of better terms) were called "up," "down," and "strange." Clearly a new technical term was needed to convey the fact that there are different types of quarks. The word "flavor" was chosen for this purpose. Quarks were said to come in three flavors until 1974, when the existence of a fourth flavor, the "charmed" quark, was confirmed. With the advent of more powerful accelerators it became possible to manufacture new flavors of heavier quarks, and the "bottom" quark was discovered in 1977. Theoretical considerations then required the existence of a sixth flavor, but the "top" quark so far has eluded direct detection.

The quark model was a prelude to the formulation of the Standard Model, a successful theory of elementary particles. With this theory it is possible to deduce the mass of the top quark; it is predicted to be roughly 150 times that of the proton. Thus it seems inevitable that experiments currently under way at Fermilab will soon lead to direct detection of the top quark. Particle physicists eagerly await this discovery, which could occur within the next two years.

Heavy Flavours is an excellent compilation of work on heavy flavor physics by investigators who have made major contributions to the field. Its 13 chapters were written specifically for the volume. Buras and Lindner, the book's editors, have contributed chapters on the role of the top quark in the Standard Model and beyond. Other outstanding contributions include a detailed treatment of the mass prediction and the anticipated phenomenology of the top quark and an introduction to the heavy quark effective field theory recently pioneered by Isgur and Wise and its application to the physics of bottom quark systems. For the most part, the material covered in this book has not yet been incorporated into textbooks. Moreover, the authors clearly have intended their chapters to serve a pedagogical purpose. As a result, this volume will meet the needs of graduate students in particle physics as well as more senior particle theorists and experimentalists who wish to keep abreast of the most recent advances in heavy flavor physics.

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Other Books of Interest

The Sexual Brain. SIMON LEVAY. MIT Press, Cambridge, MA, 1993. xvi, 168 pp. $22.50 or £14.95. A Bradford Book.

In this small book Simon LeVay, whose 1991 report in *Science* of a finding of hypothalamic differences between presumed homosexuals and heterosexuals generated a new round of debate on the subject, expounds for general readers evidence for the biological basis of human sexuality. LeVay presents the subject in a series of chapters each of which takes its title from a phrase appearing in the works of Shakespeare—"Time's millioned accidents" for the consideration of evolutionary factors, "For a woman wert thou first created" for the treatment of development, and so on through basic principles of brain organization, the functions of the hypothalamus, processes involved in sexual intercourse, courtship and maternal behavior, brain circuits for sexuality, factors in brain development, sex-differentiated behaviors that are not sexual in the strict sense, sexual orientation, and gender identity and transsexuality. In the opening chapter and elsewhere in the book LeVay makes clear his view that "the scientific evidence presently available points to a strong influence of nature, and only a modest influence of nurture" on sexual development and orientation, but the tone of the writing is nonpolemical, with explanations of some basic biology and attention to methodological aspects of some of the studies drawn on, which include behavioral studies of nonhuman species as well as neurobiological investigations. At the end of the book appear a bibliography of "sources and further reading," averaging about eight entries for each chapter; a glossary including not only such terms as "androgens" and "proceptive behavior" but also Shakespearean usages such as "child-changed," meaning "changed by one's child" and used in the title of the chapter on maternal behavior; and an index. —***Katherine Livingston***

Gregor Mendel's *Experiments on Plant Hybrids*. ALAIN F. CORCOS and FLOYD V. MONAGHAN. Drawings by Maria C. Weber. Rutgers University Press, New Brunswick, NJ, 1993. xxii, 220 pp., illus. $34; paper, $15. Masterworks of Discovery.

In an enterprise of "combin[ing] the scientific quest for the roots of things with the humanistic endeavor to make the dead letter come alive in a thoughtful mind," this volume inaugurates a series, edited by Harvey Flaumenhaft of St. John's College, Annapolis, of "guided studies of great texts in science." The more specific purpose of the series is "to foster the reading of classic texts in science, including mathematics, so that readers will become more thoughtful by attending to the thinking that is out of sight but still at work in the achievements it has generated." The example of such thinking that has been chosen for the first volume is Mendel's paper of 1866 that prepared the way for our current "easy talk about the

gene" (though the editors question Mendel's designation as the founder of genetics). Preceding the treatment of the masterwork itself are a 37-page life of Mendel and an introduction supplying "minimum basic information" about plant breeding and about peas. There follow 120 pages of "text and interpretation." Here Mendel's text is set off in a separate typeface and broken into blocks of typically 60 to 100 lines, numbered for easy reference, with interpretative comments of equal or greater length interspersed. The interpretation is focused on the text as such, without reference to secondary sources. After an epilogue in which the authors comment in a general way on more recent developments, there are appendixes describing fertilization and meiosis, giving the chronology of Mendel's experiments, discussing problems having to do with the relation between the seed and its coat, and considering, with some elementary statistics, "where is the bias?" in the experiments. Finally, the book contains a glossary, a bibliography of mostly historical works, and an index. In October Rutgers University Press will issue it in electronic form as a "Hyper!Book," with special arrangements possible for classroom use.

—*Katherine Livingston*

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Vignettes: Success

It is never wise to seek prominence in a field whose routine chores do not interest you.

—*Eugene Wigner*, in *The Recollections of Eugene Wigner, as Told to Andrew Szanton* (Plenum)

For those propelled on the Wheel of Fortune, heady pursuits like thinking have become a casualty of the time crunch.

—*Lee Burns*, in *Busy Bodies: Why Our Time-Obsessed Society Keeps Us Running in Place* (Norton)

Man has mounted science and is now run away with.

—*Henry Adams*, 1852, as quoted by Ian Inkster in *Science and Technology in History* (Rutgers University Press)

Books Received

The Atomic Energy Commission under Nixon. Adjusting to Troubled Times. Glenn T. Seaborg with Benjamin S. Loeb. St. Martin's, New York, 1993. xx, 268 pp., illus. $39.95.

The Aztecs, Maya, and Their Predecessors. Archaeology of Mesoamerica. Muriel Porter Weaver. 3rd ed. Academic Press, San Diego, CA, 1993. xx, 567 pp., illus. $54.95.

The Chemotherapy of Human Parasitic Disease. V. Bozdech and P. Mason. University of Zimbabwe Publications, Harare, 1992. x, 220 pp. Paper, $27.

Climate Change and Its Biological Consequences. David M. Gates. Sinauer, Sunderland, MA, 1993. viii, 280 pp., illus. Paper, $18.95.

Climate System Modeling. Kevin E. Trenberth, Ed. Cambridge University Press, New York, 1992. xxx, 788 pp., illus. $49.95.

Climate under Cover. Digital Dynamic Simulation in Plant Bio-Engineering. Tadashi Takakura. Kluwer, Norwell, MA, 1993. xii, 155 pp., illus. $84.

CO_2 and Biosphere. J. Rozema *et al.*, Eds. Kluwer, Norwell, MA, 1993. x, 484 pp., illus. $302. Advances in Vegetation Science, 14. From a workshop, Wageningen, The Netherlands, Nov. 1991. Reprinted from *Vegetatio*, vol. 104/105.

Cocaine. Physiological and Physiopathological Effects. Alfonso Paredes, David A. Gorelick, and Barry Stimmel, Eds. Haworth, Binghamton, NY, 1992. viii, 130 pp., illus. $26.95; paper, $19.95. Published as *Journal of Addictive Diseases*, vol. 11, no. 4.

Collecting the Pre-Columbian Past. Elizabeth Hill Boone, Ed. Dumbarton Oaks Research Library and Collection, Washington, DC, 1993. vi, 359 pp., illus. $30. From a symposium, Washington, DC, Oct. 1990.

Coming to Life. Leston Havens. Harvard University Press, Cambridge, MA, 1993. x, 206 pp. $22.50.

Communication within Animal Cells. Greg J. Barritt. Oxford University Press, New York, 1992. xvi, 343 pp., illus. $95.

The Elusive Transformation. Science, Technology, and the Evolution of International Politics. Eugene B. Skolnikoff. Princeton University Press, Princeton, NJ, 1993. xiv, 322 pp., illus. $39.50. A Council on Foreign Relations Book.

Environmental Change. Andrew Goudie. 3rd ed. Clarendon (Oxford University Press), New York, 1992. xx, 329 pp., illus. $55; paper, $23.

Environmental Poisons in Our Food. J. Gordon Millichap. PNB, Chicago, 1993. xiv, 271 pp. Paper, $14.95.

Freedom and Tenure in the Academy. William W. Van Alstyne, Ed. Duke University Press, Durham, NC, 1993. xiv, 429 pp. $39.95. Augmented version of *Law and Contemporary Problems*, vol. 53, no. 3 (1990).

From Kostenki to Clovis. Upper Paleolithic-Paleo-Indian Adaptations. Olga Soffer and N. D. Praslov, Eds. Plenum, New York, 1993. xx, 334 pp., illus. $49.50. Interdisciplinary Contributions to Archaeology.

From Sails to Satellites. The Origin and Development of Navigational Science. J. E. D. Williams. Oxford University Press, New York, 1992. x, 310 pp., illus. $35.

History of International Broadcasting. James Wood. Peregrinus, Stevenage, Herts., U.K., 1992 (U.S. distributor, IEEE Service Center, Piscataway, NJ). xx, 258 pp., illus. $59. IEE History of Technology Series, 19.

Human Biology in Papua New Guinea. The Small Cosmos. Robert D. Attenborough and Michael P. Alpers, Eds. Clarendon (Oxford University Press), New York, 1992. xiv, 427 pp., illus. $98. Research Monographs on Human Population Biology, 10

Inverse Problems in Scattering and Imaging. M. Bertero and E. R. Pike, Eds. Hilger, Philadelphia, 1992 (distributor, American Institute of Physics, New York). xii, 426 pp., illus. $100. Malvern Physics Series. From a workshop, Cape Cod, MA, April 1991.

The Jepson Manual. Higher Plants of California. James C. Hickman, Ed. University of California Press, Berkeley, 1993. xviii, 1400 pp., illus. $65.

Mammal Species of the World. A Taxonomic and Geographic Reference. Don E. Wilson and DeeAnn M. Reeder, Eds. 2nd ed. Smithsonian Institution Press, Washington, DC, 1993. xviii, 1206 pp., illus. $75.

Mammalian Amino Acid Transport. Mechanisms and Control. Michael S. Kilberg and Dieter Haussinger, Eds. Plenum, New York, 1992. x, 318 pp., illus. $85. From a conference, Titisee, Germany, May 1990.

Nuclear Magnetic Shieldings and Molecular Structure. J. A. Tossell, Ed. Kluwer, Norwell, MA, 1993. xvi, 584 pp., illus. $199. NATO Advanced Science Institutes Series C, vol. 386. From a workshop, College Park, MD, July 1992.

Planets Around Pulsars. J. A. Phillips, S. E. Thorsett, and S. R. Kulkarni, Eds. Astronomical Society of the Pacific, San Francisco, 1993. xvi, 391 pp., illus., $40; to ASP members, $36. ASP Conference Series, vol. 36. From a conference, April 1992.

Principles and Applications of Aquatic Chemistry. François M. M. Morel and Janet G. Hering. Wiley, New York, 1993. xviii, 588 pp., illus. $59.95. New edition of *Principles of Aquatic Chemistry*.

Produced Water. Technological/Environmental Issues and Solutions. James P. Ray and F. Rainer Engelhardt, Eds. Plenum, New York, 1992. xvi, 616 pp., illus. $129.50. Environmental Science Research, vol. 46. From a symposium, San Diego, CA, Feb. 1992.

Program Verification. Fundamental Issues in Computer Science. Timothy R. Colburn, James H. Fetzer, and Terry L. Rankin, Eds. Kluwer, Norwell, MA, 1993. xiv, 457 pp., illus. $205. Studies in Cognitive Systems, vol. 14.

Pursuing Parenthood. Ethical Issues in Assisted Reproduction. Paul Lauritzen. Indiana University Press, Bloomington, 1993. xxii, 167 pp. $19.95. Medical Ethics Series.

RNA Methodologies. A Laboratory Guide for Isolation and Characterization. Robert E. Farrell, Jr. Academic Press, San Diego, CA, 1993. xiv, 317 pp., illus. Spiral bound, $49.95.

Robotic Telescopes in the 1990s. Alexei V. Filippenko, Ed. Astronomical Society of the Pacific, San Francisco, 1992. xvi, 367 pp., illus. $40; to ASP members, $36. ASP Conference Series, vol. 34. From a symposium, Laramie, Wyoming, June 1991.

Robotics. The Marriage of Computers and Machines. Ellen Thro. Facts on File, New York, 1993. viii, 119 pp., illus. $17.95. Facts on File Science Sourcebooks.

The Sputnik Challenge. Robert A. Divine. Oxford University Press, New York, 1993. xviii, 245 pp. $25.

Star Formation in Stellar Systems. G. Tenorio-Tagle, M. Prieto, and F. Sánchez, Eds. Cambridge University Press, New York, 1992. xiv, 573 pp., illus. $69.95. From a school, Tenerife, Spain, Dec. 1991.

Stochastic Equations in Infinite Dimensions. Giuseppe Da Prato and Jerzy Zabczyk. Cambridge University Press, New York, 1992. xviii, 454 pp. $89.95. Encyclopedia of Mathematics and Its Applications, 44.

Stress Regimes in the Lithosphere. Terry Engelder. Princeton University Press, Princeton, NJ, 1993. xvi, 457 pp., illus. $75.

Studies of Supply and Demand in Higher Education. Charles T. Clotfelter and Michael Rothschild, Eds. University of Chicago Press, Chicago, 1993. x, 294 pp., illus. $45. National Bureau of Economic Researh Project Report. From a conference, Williamsburg, VA, May 1991.

Sulphones in Organic Synthesis. N. S. Simpkins. Pergamon, Tarrytown, NY, 1993. xii, 381 pp., illus. $99; paper, $54. Tetrahedron Organic Chemistry Series, vol. 10