

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 non-polemical, with explanations of some basic biology and attention to methodological aspects of some of the studies drawn on, which include behavioral studies of non-human 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