

honeybee workers tend to be genetic specialists and not perfectly interchangeable. Prominent in this field are the groups of Page (who contribute two chapters to the book) and Moritz. Page has shown that the high level of genetic variation in honeybee colonies resulting from the queen's mating many times is associated with genetic differentiation between performers of various tasks. Moritz has demonstrated high heritabilities for various social behaviors and an increase of group efficiency with the appropriate genetic structure. Now Page and co-workers present the first elements of a theory relating worker task specialization to colony fitness. Not surprisingly, these elements are incomplete: I am not sure whose fitness is being maximized (queens' workers?), and I wonder if additive effects are really more plausible than multiplicative ones in the combination of the numerous factors.

The theme of colony-level selection is continued by Owen, who treats it as a form of mating-type selection and finds that the likelihood of polymorphic equilibria is strongly affected by such parameters as the extent of reproduction by workers (which often can and do lay eggs). He also notes evidence for variation of colony characteristics in natural populations of various social insects, variation that could open the way for serious studies of social evolution in organisms other than honeybees. The question of the nature of the colony organization being selected for is given further zest by behavioral modeling that suggests the possibility of a colony memory outliving any one generation. Thus a link is established to the cultural evolution studies lavished on humans and other vertebrates.

The importance of male haploidy in the evolution of eusocial behavior is the question for Strassmann and Queller, who contribute two chapters based on that classical system for insect sociobiology, *Polistes* paper wasps. An impressive data set, gathered with sweat (and no doubt tears—the wasps can sting) in the hot Texas sun is used in combination with the results of others to test various predictions based on male-haploid effects on relatedness in kin selection models. The authors conclude that most of the hypotheses fail the tests, but this seems to be more because the data are so far insufficient than because predicted trends are definitely not there. The conclusion that eusociality is maintained because single females cannot raise broods avoids the question of how the remote solitary ancestors of such species came to take up group living in the first place. Certainly, however, the evolution of eusociality is better studied in insects with primitive social systems, such as

Polistes, and it is right to call for more data of the kind that Strassmann's group is collecting, which involves both genetic structure and the costs and benefits of sociality.

Other chapters address a variety of socially related evolutionary problems in exemplar species. Kukuk shows that relatedness is high enough within colonies of the primitively eusocial bee *Dialictus zephyrus* to make it plausible that kin selection maintains sociality in this species, while considerably advancing our knowledge of the genetics of natural populations of such bees. Mintzer shows that the cues used in colony recognition by acacia ant colonies must be polygenic rather than single-locus in inheritance. Ross presents a progress report of work on a dramatic evolutionary change taking place in introduced fire ant populations—from single- to multiple-queened colonies. Ward discusses speciation patterns in ants, finding little evidence that social organization affects the common pattern of allopatric speciation observed, while leaving open the possibility that socially parasitic species may undergo sympatric speciation.

So what are we left with from this set of current highlights? That the interaction of sociality with genetics and evolution is probably nowhere better studied than in the eusocial insects. Where a reasonable amount of money is available for collection of data, as in the honeybee case, startling findings, poorly anticipated by theory, emerge. The colony, once seen as an optimized entity, dissolves into a welter of conflicting cooperative and competitive activities, as seen clearly in one field not represented here, the study of sex allocation. Little else in the genetic biology of social insects escapes the influence of their sociality. And the way to understanding this sociality is clearly through genetics; epigenetic models, for example, logically devolve to genetic ones.

But what can insect sociobiology tell us about that of other organisms? It is a cliché that the body of theory is universally portable, but what about the empirical findings? Tempting though it is to recall the justification of their work given by some *Drosophila* students, that humans and flies share 40% of their loci, one really doubts that foraging genotypes in bees will have homologs in mammalian societies. On the other hand, study of eusocial insects should help better define the conditions to look for in other societies. Of course, those who regard the eusocial insects as one of the marvels of nature need no such encouragement to study them.

ROSS H. CROZIER

School of Biological Science,
University of New South Wales,
Kensington, NSW, Australia 2033

Platelets

Platelet Immunobiology. Molecular and Clinical Aspects. THOMAS J. KUNICKI and JAMES N. GEORGE, Eds. Lippincott, Philadelphia, 1989. xiv, 498 pp., illus. \$85.

It wasn't many years ago that platelets were almost exclusively the domain of the hematologist. The little bags of cytoplasm were of little interest to other workers who sought to understand fundamental concepts of how "real" cells functioned. Platelets were held to be different. There was something special, almost mystical, about them and the way they had to be manipulated in the laboratory. Terms such as "viscous metamorphosis" and "release reaction" held the non-platelet expert at bay. Much has changed in recent years, with the platelet having served as a vehicle for major advances in understanding cellular function. Much of what we now know about arachidonic acid metabolites, phosphoinositide metabolites, and mechanisms of cellular adhesion have come from studies of platelets.

This volume addresses what is probably the most forbidding and arcane area of platelet science, immunobiology. Just the thought of platelet serology and platelet antigens with names like Bak^a, Yuk^b, or DUZO intimidates even many of us who work with platelets daily. This book could contain (and, in fact, does contain) some really esoteric stuff. Fortunately, the editors have adopted a broader perspective of what constitutes platelet immunobiology. The result is a volume that should appeal to an audience beyond the aficionados of platelet serology.

This book covers a lot of ground in 22 chapters. All the expected material is included. There are the predictable chapters dealing with an assortment of platelet antigens: isoantigens, alloantigens, autoantigens, and drug-dependent antigens. Other chapters address platelet IgG, Fc receptors, and the interactions of platelets with complement. By and large these are quite well done, don't get bogged down in serologic jargon, and serve to enlighten and inform. The chapter by Aster dealing with the immunologic thrombocytopenias is a jewel. It may well be the single best compendium of information on this topic currently available.

Several early chapters are devoted to the structural elements of platelet membranes including glycoproteins, glycolipids, and proteoglycans. This information is readily available elsewhere, but it serves as a scientific foundation for the remainder of the volume. A section of five chapters describing the application of antibody probes to the study of platelet biochemistry and molecular

biology easily could have been omitted from a volume of platelet immunobiology had the editors adopted a narrower perspective. I'm glad they didn't. Much of what we know about the structure and function of platelet surface receptors has come from studies using immunochemical approaches. Although devoted for the most part to the platelet, the approaches outlined in these chapters are applicable to other cell systems.

The editors apparently gave the authors of individual chapters free rein. Contributions range from comprehensive literature reviews to brief overviews to lucid descriptions of an immunochemical approach to a single experimental problem. Most are written in the scholarly style to which we are accustomed, but others, for example the provocative chapter by George on platelet IgG, are written in a more proselytizing style. Although I appreciate the broader approach exemplified in *Platelet Immunobiology*, the eclecticism of the volume does give rise to some fragmentation and redundancy. All in all, this book fills a niche. It should find acceptance.

SAMUEL A. SANTORO

Division of Laboratory Medicine,
Washington University School of Medicine,
St. Louis, MO 63110

Some Other Books of Interest

100 Years Exploring Life, 1888–1988. The Marine Biological Laboratory at Woods Hole. JANE MAIENSCHIN. Selection and arrangement of photographs by Ruth Davis. Jones and Bartlett, Boston, 1989. xvi, 192 pp., illus. \$22.50.

Likely to be especially appealing as an orientation for summer sojourners, this informal centennial "testament" is focused on human rather than marine life in the environs of the Marine Biological Laboratory. An opening chapter, "Arriving at Woods Hole," begins by depicting the Friday night traffic jams of today and moves backward to describe the arrival of the MBL itself and the activities of Louis Agassiz, Spencer Fullerton Baird, Alpheus Hyatt, and others who played a role in the establishment of science in the area. Where and how visitors live and eat are the subject of another chapter, with perhaps more relish for the options that have been available for those who are "not too fussy" than for the increasing opportunities for utilizing "plenty of money," and with a digression on the one-time whaling and fishing activities of the town and an account of the hurricane of 1938. Accounts of buildings and budgets and the library and publications avoid bureaucratic detail and are enlivened by stories of a fire in which a cow rented by Thoms Hunt Morgan es-

caped and how a feckless student of Jacques Loeb's, beginning "with more zeal than knowledge," was with the aid of India ink made aware of the need "to reflect more deeply." A chapter entitled "The people" gives attention to administrators, scientific eminences, families thereof, miscellaneous retainers, and visitors, including Emperor Hirohito, who, unlike William Rainey Harper, was not hit with a piece of watermelon. The chapter "Doing science" explains some of the rationale of the enterprise but with attention to the day-to-day side—equipment, techniques, collecting excursions. The last two chapters describe extralaboratory diversions and "friends and relatives" of the MBL, including local supporters, other marine labs, the Coast Guard, and the apparently ambivalently regarded Woods Hole Oceanographic Institution. Maienschein, who previously edited a collection of the MBL's earliest Friday Evening Lectures (*Defining Biology*, Harvard University Press, 1986; see *Science* **234**, 1595 [1986]), has in preparing this work drawn extensively on taped interviews and other materials in the MBL Archives, the source also of the many photographs that accompany the text. The serious Woods Hole aficionado will also want a copy of F. R. Lillie's 1944 *The Woods Hole Marine Biological Laboratory*, reprinted for the centennial as a supplement to volume 174 of MBL's *Biological Bulletin* and available from the *Bulletin* office for \$10.—K.L.

A Neotropical Companion. An Introduction to the Animals, Plants, and Ecosystems of the New World Tropics. JOHN C. KRICHER. Illustrated by Andrea S. LeJeune. Princeton University Press, Princeton, NJ, 1989. xii, 436 pp., illus. \$45; paper, \$16.95.

"For anyone sympathetic with the pursuit of natural history, a visit to a tropical region is a must," writes John Kricher. This book is addressed to such an audience: "to introduce you to what it is about the American tropics that makes me and my many colleagues want to keep returning and studying." The volume opens with an overview of tropical ecosystems. Then rainforest is described in two chapters, one of "first impressions" ("Imagine we are standing on Pipeline Road in the Canal Zone in Panama. . .") with some practical advice about health and safety, the other outlining the functioning of the forest—nutrient cycling, ecological succession, agriculture and its concomitants. A third chapter considers the rainforest as a "laboratory of evolution." Rainforest plants are then discussed as a source of beneficial drugs, with excursions into such subjects as animal feeding special-

izations and mimicry. There follow a summary of the neotropical avifauna and a "rain-forest bestiary" encompassing mammals, reptiles and amphibians, and invertebrates. Finally, the author briefly describes non-rainforest ecosystems: savannas and the mangroves, seagrasses, and coral reefs of coastal areas. An epilogue setting out current concerns about the "fate of the tropics," a glossary, lists of references cited and general works, and two indexes are included. Illustrated with black-and-white drawings of characteristic biological forms, the volume is attractively produced and compact enough to be easily portable for the traveler.—K.L.

Books Received

AIDS. Profile of an Epidemic. Pan American Health Organization, Washington, DC, 1989. xviii, 365 pp., illus. Paper, \$36. Scientific Publication no. 514.

Algae and Human Affairs. Carole A. Lembi and J. Robert Waaland, Eds. Cambridge University Press, New York, 1989. viii, 590 pp., illus. \$67.50.

Alternate Realities. Mathematical Models of Nature and Man. John L. Casti. Wiley-Interscience, New York, 1989. xviii, 493 pp., illus. \$34.95.

American High. The Years of Confidence, 1945–1960. William L. O'Neill. Free Press (Macmillan), New York, 1989. xii, 321 pp. + plates. Paper, \$9.95. Reprint, 1986 ed.

American Psychology in the Quest for Nuclear Peace. Marilyn S. Jacobs. Praeger, Westport, CT, 1989. xxii, 181 pp. \$39.95.

Amyloid and Amyloidosis. Takashi Isobe *et al.*, Eds. Plenum, New York, 1988. xx, 885 pp., illus. \$135. From a symposium, Hakone, Japan, Oct. 1987.

Analytical Aspects of Drug Testing. Dale G. Deutsch, Ed. Wiley-Interscience, New York, 1989. xvi, 304 pp., illus. \$75. Chemical Analysis, vol. 100.

Ancient Trade and Tribute. Economies of the Sonoran Region of Mesoamerica. Barbara Voorhies, Ed. University of Utah Press, Salt Lake City, 1989. xiv, 336 pp., illus. \$30.

Animal Sonar. Processes and Performance. Paul E. Nachtigall and Patrick W. B. Moore, Eds. Plenum, New York, 1988. xvi, 862 pp., illus. \$125. NATO Advanced Science Institutes Series A, vol. 156. From an institute, Helsingør, Denmark, Sept. 1986.

The Biolab Book. Lundy Pentz. 2nd ed. Johns Hopkins University Press, Baltimore, 1989. x, 142 pp., illus. Spiral bound, \$10.95.

Biology. Exploring Life. Gil D. Brum and Larry K. McKane. Wiley, New York, 1989. xvi, 727 pp., illus., + index and appendices. \$49.

Biology and Freedom. An Essay on the Implications of Human Ethology. S. A. Barnett. Cambridge University Press, New York, 1989. xviii, 376 pp., illus. \$39.50.

Biotechnological Applications of Lipid Microstructures. Bruce Paul Gaber, Joel M. Schnur, and Dennis Chapman, Eds. Plenum, New York, 1988. \$79.50. Advances in Experimental Medicine and Biology, vol. 238. From workshops, Tenerife, Canary Islands, Jan. 1986, and San Sebastian, Spain, Oct. 1987.

Biotechnology. Vol. 6b, Special Microbial Processes. Hans-Jürgen Rehm, Ed. VCH, New York, 1989. xvi, 810 pp., illus. \$298.

The Causes and Cures of Criminality. Hans J. Eysenck and Gisli H. Gudjonsson. Plenum, New York, 1989. xvi, 309 pp. \$34.50. Perspectives on Individual Differences.

Cell Surface Antigen Thy-1. Immunology, Neurology, and Therapeutic Applications. Arnold E. Reif and Michael Schlesinger, Eds. Dekker, New York, 1989. xxvi, 618 pp., illus. \$99.75. Immunology Series, vol. 45.

Cellular and Molecular Biology of Muscle Development. Laurence H. Kedes and Frank E. Stockdale, Eds. Liss, New York, 1989. xxvi, 1059 pp., illus. \$195; paper, \$69.50. UCLA Symposium on Molecular and Cellular Biology, vol. 93. From a symposium, Steamboat Springs, CO, April 1988.

Chemistry. John C. Bailar, Jr. *et al.* 3rd ed. Harcourt Brace Jovanovich and Academic Press, San Diego, CA, 1989. xvi, 116 pp., illus. \$38.