tact and fomites transmission are possible. Equines seem essential to epidemic occurrence, however, although man-mosquito spread is possible. The chief hope for control lies in a live virus vaccine (TC 83), which appears to be safe for both man and horses. Its use to vaccinate several million horses is given much credit for containing the 1970–71 epidemic. The detailed presentation of this story is fragmented and often anecdotal but provides a wealth of information, both factual and methodologic, which will be of interest to medical entomologists and ecologists and other students of zoonotic disease. Fortunately for all readers, the story is admirably summarized in presentations by McKinney, by Chamberlain, and, most comprehensively, by Telford Work.

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Human Genetic Variation

The Biochemical Genetics of Man. D. J. H. BROCK and OLIVER MAYO, Eds. Academic Press, New York, 1972. xii, 726 pp., illus. $29.50.

It would be unfair to the contributors and editors of this volume if it were to be judged solely on the basis of achieving its stated aim, namely "to be comprehensive in approach both to the fact and theory of human biochemical genetics." No volume of 725 pages, or for that matter 7250 pages, could deal comprehensively with the facts of a field which has become as pervasive in current biomedical inquiry as biochemical genetics has. It is accomplishment enough that in its 14 chapters, coauthored by 15 contributors, this volume provides a more comprehensive framework for human biochemical genetics than has been available previously. I know of no other volume in which detailed accounts of blood group antigens, leukocyte antigens, and coagulation disorders are accompanied by descriptions of more "classic" biochemical genetic concepts such as protein polymorphisms and inborn errors of metabolism. Each chapter is thoroughly referenced and logically organized.

The book is divided into three sections: Genetic Basis of Variation (three chapters); Normal Variation (six chapters); and Pathological Variation (five chapters). This organization is valuable because it emphasizes the ubiquity of human genetic variation and because it demonstrates that mutation is not synonymous with disease. To its detriment as a textbook, however, this arbitrary separation of normal and pathologic variation means that the discussions of normal variation of hemoglobin or immunoglobulin structure, for example, are hundreds of pages removed from the description of disorders caused by pathologic variation of these proteins, the so-called hemoglobinopathies and immunoglobulinopathies. This dispersion of subject matter also magnifies the redundancy so characteristic of many-authored works. Thus, no fewer than four chapters concern themselves with protein and enzyme polymorphisms, a surfeit for even this important topic. The chapters entitled "Haemoglobin variation," "The immunoglobulinopathies," and "Unsolved Mendelian diseases" are particularly praiseworthy for their readable style, their informative tables, and their effective collation of large bodies of detailed and complex information. The textual material on inborn errors is necessarily brief, but the diversity of such conditions is emphasized by 17 tables which classify these disorders according to their biochemical bases.

The advanced student of biochemical genetics and investigators in this and related fields will find the volume an important reference and guide to further reading.

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Festschrift

Evolutionary Biology. Vol. 6. THEODOSIUS DOBZHANSKY, MAX K. HECHT, and WILLIAM C. STEERE, Eds. Appleton-Century-Crofts, New York, 1972. xvi, 446 pp., illus. $19.95.

This festschrift for George Gaylord Simpson is, unlike most festschrifts, almost worthy of its subject. There are only about four potboilers, three of them on man, and pomposity is otherwise restricted to the petrosal bone. Simpson's influence has been mainly by his writings (the dedication misleadingly implies that all his few students were invited to contribute), and several of the authors have been associated with Simpson mainly in this way. The subjects treated more or less represent current activity in evolutionary vertebrate zoology rather than the areas of Simpson's work.

A plausible argument could be made that evolution is the control of development by ecology. Oddly, neither area has figured importantly in evolutionary theory since Darwin, who contributed much to each. This is being slowly repaired for ecology, although the festschrift gives no evidence of it, but development is still severely neglected notwithstanding an interesting paper here by Gould on the evolution of growth in the coiled oyster *Gryphaea.* (Unfortunately Gould confuses growth with form, tightness of coiling with number of coils.)

Several other papers are also first-rate. Romer finally gives us his full analysis of the visceral-somatic dichotomy in vertebrate anatomy. He then uses this to treat the origin of vertebrates from the top down, so to speak, and makes an original and convincing story. McDowell makes a long and beautiful morphological analysis of a crucial aspect of the origin of snakes but flounders when he digresses to population ecology. Hoffstetter's now almost revolutionary thesis on an African origin for South American rodents and monkeys gets its longest treatment and its first in English. I think he is right but somewhat overstates the evidence. Lewontin finds genic diversity among human races to be only a tenth of that within single populations. He then ignores the phenotype, which is where adaptation comes in, and concludes that "human racial classification [has] no justification." His factual result may, however, be interpreted to mean that the special adaptations of human populations to different environments involve only a relatively small part of the genome.

The bibliography of Simpson's publications will be useful. In the very next paper, though, three paleontologists (no less) conclude that stratigraphic position is totally irrelevant to determination of phylogeny and almost say that no known taxon is derived from any other. I don't think Simpson will agree.

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