to have considerable support. These difficult species problems are found in the family throughout the world and are troublesome to solve because black flies do not lend themselves to laboratory colonization and experimentation.

The introductory portion contains good discussions of the life history, adult habits, zoogeography, relation to disease, anatomy of adult, pupa, and larva, and of the collection, preservation, and examination of material. This is followed by a taxonomic treatment of the species, which are arranged in the two genera *Cnephia* and *Simulium*. Characters are given for dividing the latter genus into two divisions, not named as subgenera, and these are again divided into seven species groups. The classification of the Simuliidae is still far from satisfactory, and there is great need for the coordination of the several systems that have been suggested for various faunas. The species are well described, and figures and keys are given to separate the females, males, and pupae. Distribution is given by country and, wherever known, there are notes on the larva and habits. This most welcome addition to our knowledge of the fauna of tropical Africa will be extremely useful in determining the species.

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Biology. Paul B. Weisz. McGraw-Hill, New York, 1954. 679 pp. Illus. $6.50.

The first 13 pages of *Biology* present the properties of life in broad outline against a background of the physical environment of the earth that furnishes the conditions where life is possible. Following this, at the "second level," 94 pages are devoted to a more intensive treatment of environmental relationships (soil and carbon and nitrogen cycles), composition of protoplasm (elements, compounds, ions, colloids, membranes, and osmosis), basic metabolic processes (catalysis, enzymes, photosynthesis, energy metabolism, and types of nutrition), and self-perpetuation (cellular and organismic regulation and reproduction, adaptation, sexuality, heredity, and evolution). The remaining 543 pages consider successively cell structure and function, differentiation and specialization, plant structure and function, skeletal and muscular physiology, community and social organization, photosynthesis and transpiration in plants, digestion and circulation in animals, respiration and energy metabolism, synthesis, vitamins, hormones, blood functions, excretion, circulatory mechanisms, nervous system and sense organs, reproduction (mitosis, growth, and gametogenesis), plant life-histories, human reproduction and its hormonal regulation, and genetics and evolution.

In returning to the same principles at successively higher levels of treatment, this book differs somewhat in plan from other biology textbooks. The author consciously tries to avoid methodical, compartmentalized handling of his material by integrating the main ideas of biology around processes rather than taxonomic groups or organ systems. Classification is relegated to six pages in the appendix. Only the briefest treatment is accorded to invertebrates, and even the comparative treatment of the lower vertebrate groups is only moderately developed. The emphasis is predominantly on human functions. The claim is made in the foreword that formal physics and chemistry are not necessary, that such physicochemical concepts as are needed are developed in the textbook itself. It may be questioned, however, whether the student with no previous chemistry can acquire from a few pages of simplified and condensed synopsis the necessary background for an adequate understanding of the role of pyruvic acid, adenosine triphosphate, and so forth, in energy metabolism. Weisz thinks that it is possible and makes a courageous attempt to give the student an insight into the chemical workings of the enzymes in cell metabolism.

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Introduction to a Study of Mechanical Vibration. G. W. Van Santen. Philip's Technical Library, Eindhoven, Holland; U.S. Dist., Elsevier Press, Houston, Texas, 1953. 296 pp. Illus.

The preface of this book states, "The object . . . is to review the elementary theory of Mechanical Vibrations, as well as some of the more important problems of vibration encountered in practice. . . . Every effort has been made to present each individual subject so as to demonstrate the essentials of the problems and thus provide a jumping off point for a special study of any particular branch of the work. At the same time we have tried in each instance to indicate practical lines for the direct solution of many problems."

To fulfill this object, the author has chapters in the usual order on definitions and free and forced vibrations. These are followed by chapters on electromechanical analogies, coupling between two and three mass systems, and simple isolation. Vibrational waves are studied to introduce the subject of sound isolation and control, and there are brief discussions of associated topics ranging from ultrasonics to seismology. Lateral critical speeds in shafts are briefly covered from the engineering point of view, since only the first critical speed is considered. Tangential effort diagrams and Holzer tables are outlined in the section on torsional vibrations. This is followed by a brief discussion of balancing, damping, self-excited vibrations, fatigue in materials, and human reactions to vibrations.

Three chapters are used to survey the general field of vibration measurement, with emphasis on vibration equipment manufactured by N. V. Philips, Eindhoven, Holland. The last chapter is a short but well-illustrated and interesting discussion of the human ear. Three short appendixes give common trigonometric formulas, complex quantities, and phase deter-