

Each chapter is concluded with an excellent set of questions and problems. There is an appendix listing organic type reactions and a satisfactory index. The type is large and easily legible and there are very few errors, technical or typographical. The book should prove very desirable for its intended uses.

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**A Manual of the Chiggers.** The biology, classification, distribution, and importance to man of the larvae of the family Trombiculidae (Acarina). Memoirs of the Entomological Society of Washington, No. 4. G. W. Wharton aided by H. S. Fuller. Washington, D. C.: Entomological Society, c/o U.S. National Museum, 1952. 185 pp. Illus. \$6.00.

This book will be a valuable aid to the study of what is probably the least known of the important groups of arthropod pests and disease carriers. It contains sections on the public health importance of chiggers, behavior, life cycles and methods of culturing, anatomy, distribution, and ecology. There is a very extensive bibliography. The bulk of the book, however, is devoted to a catalogue of the known chiggers of the world, with keys to the level of genera and subgenera. Thus the book is not a manual in the usual sense, for no species could be identified with the aid of this work alone; however, it does provide a good general account of the chigger mites together with a most excellent guide to the literature of the world. Localities are given only to country in the catalogue. The usefulness of the work would have been vastly increased had locality data, especially type localities, been more thoroughly treated. This could have been done in only a little more space.

In a work of this scope much is necessarily the result of compilation. It should be pointed out, however, that considerable new material, mostly the result of ecological studies by Wharton and his associates, is included.

Errors are inevitable in a work of this scope. One may be mentioned. It is clearly an error that certain illustrations were credited to "Wharton *et al.*, 1951"; these were prepared and published by D. W. Jenkins and were properly credited to him in 1951. To me it seems unfortunate that, under "Collecting Methods," Lipovsky's washing technique, considered by many as the best way of obtaining chiggers from their hosts, is minimized.

Of far greater importance are criticisms having biological implications. The following comments concern not only this book but all recent American works on these mites, including those from the laboratory of the undersigned.

1. The scheme of terminology for some of the leg setae does violence to all concepts of homology and is likely to be misunderstood. Unbranched setae on the legs are given special names, such as mastitibiala and mastitarsala. The homologous setae, if branched, are not so designed. Thus if a couplet in a key should

read "mastitarsala present" and "mastitarsala absent" it would really mean only that a certain seta is simple in the first instance, branched in the second, not that a certain seta is present or absent. It will be difficult to homologize all leg setae but at least we should avoid deceptive terminology. The use of expressions like "sensory setae" is also dubious, since probably all the setae have sensory functions.

2. Relationships are best indicated by considering the chiggers as one of the several subfamilies of Trombiculidae rather than singling them out for elevation to family rank merely because they happen to have received recent intensive study as parasites of vertebrates and as disease vectors. Wharton's subfamilies would then be called tribes of the subfamily Trombiculinae.

Such shortcomings as these result largely from our meager knowledge of the group and some of them could scarcely have been eliminated from a comprehensive work on chiggers at this time. The authors are to be congratulated on a very useful contribution.

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## Scientific Book Register

**Order-Preserving Maps and Integration Processes.** Annals of Mathematics Studies, No. 31. Edward J. McShane. Princeton, N. J.: Princeton Univ. Press, 1953. 136 pp. \$2.75.

**Luminescence and the Scintillation Counter.** S. C. Curran. New York: Academic Press; London: Butterworths, 1953. 219 pp. Illus. \$5.80.

**Volcanoes as Landscape Forms.** Rev. ed. C. A. Cotton. New York: Wiley, 1952. 416 pp. Illus. + plates. \$9.00.

**Plant Morphology.** Arthur W. Haupt. New York-London: McGraw-Hill, 1953. 464 pp. Illus. \$8.00.

**Disease and Its Conquest.** G. T. Hollis. New York: Oxford Univ. Press, 1953. 163 pp. \$2.50.

**La Pensée Artificielle: Introduction à la Cybernétique.** Pierre de Latil. Paris: Librairie Gallimard, 1953. 332 pp. Illus. + chart. 890 fr.

**Conferences on Drug Addiction Among Adolescents.** Sponsored by the Committee on Public Health Relations of the New York Academy of Medicine. New York-Toronto: Blakiston, 1953. 320 pp. \$4.00.

**Kernel Functions and Elliptic Differential Equations in Mathematical Physics.** Stefan Bergman and M. Schiffer. New York: Academic Press, 1953. 432 pp. Illus. \$8.00.

**Progress in Metal Physics,** Vol. IV. Bruce Chalmers, Ed. New York: Interscience; London: Pergamon Press, 1953. 403 pp. Illus. + plates. \$9.00.

**Quantum Chemistry.** Kenneth S. Pitzer. New York: Prentice-Hall, 1953. 529 pp. Illus. \$7.50.

**Philosophy: An Introduction.** Archie J. Bahm. New York: Wiley; London: Chapman & Hall, 1953. 441 pp. Illus. \$4.50.

**Outlines of Structural Geology.** 3rd ed. E. Sherbon Hills. New York: Wiley, 1953. 182 pp. Illus. + plates. \$3.00.

**Properties and Numerical Relationships of the Common Elements and Compounds.** 5th ed. J. E. Belcher and J. C. Colbert. New York: Appleton-Century-Crofts, 1953. 366 pp. Illus. \$3.00.