technique, the evidence from staining is, at least so far, negative. (2) Proponents of the microbial theory can point out that the aphid particles do not resemble classical mitochondria because of their stability and their size. However, the studies of Watanabe and Williams (*J. Gen. Physiol.*, 34, 675 [1951]) on the sarcosomes of insect flight muscles disclose another type which approaches the stability and size of the aphid particles. (3) The aphid particles are supposed to be added intact to the developing egg from the "mycetocytes" of the parent, so that the egg can be regarded as being infected by exogenous microorganisms. But if one examines the critical review of, and careful original work on, the subject of the ontogeny of the "mycetocytes" by Uichanco (*Philippine J. Sci.*, 24, 143 [1924]), one will find no direct or conclusive evidence for the continuity of the particles of the parental mycetocytes with the particles that suddenly appear in the developing egg or embryo in the oviduct. (4) The aphid particles are said to have been grown *in vitro*. All such claims need verification. Some reportedly successful experiments involve very simple techniques and can easily be repeated. My own attempts to cultivate them, including the use of hanging drop techniques where individual particles could be observed, were not successful.

If the aphid particles are cell particulates, mitochondrial in nature, the question is raised as to the function of cells apparently containing little more than mitochondria. These cells are intimately associated with the fat body in aphids, and what are possibly similar cells in some other insects are also imbedded in the fat body. Since mitochondria are centers of Krebs cycle activity, it might be tentatively postulated that there is a division of labor among the cells of the fat body, certain cells ("mycetocytes") being primarily responsible for providing the energy for the synthesis of fats, proteins, and glycogen, with the typical fat cells being responsible for the storage of these materials. Present work on the particles of the "mycetocytes" of aphids and other insects is exploring this possibility. The presence of Krebs cycle enzymes in the particles would not, of course, directly disprove the microbial hypothesis. The presence or absence of DNA appears to be the most critical question in this respect, and I feel that until someone can show conclusively that the particles contain DNA granules or nuclei, they should be regarded as cell particulates rather than as microorganisms.

U. N. LANHAM

Department of Zoology, University of Michigan

Book Reviews

Botany of Sugarcane. C. van Dillewijn. Waltham, Mass.: Chronica Botanica; New York: Stechert-Hafner, 1952. 371 pp. $6.00.

A comprehensive new book of value to sugar technologists and cane growers alike has been produced by Dr. van Dillewijn, formerly director of the Sugar Experiment Station, Cheribon, Java. The title page appears to suggest that the book is part of a series in preparation, or proposed, entitled "Handbook of Sugarcane." Volume I, *Botany of Sugarcane,* is devoted to the structure, growth, and physiology of the sugar-cane plant, with emphasis on the application of scientific studies to crop production. Chapters 1–6, inclusive, comprise a richly illustrated description of the outer and inner morphology of sugar cane, with separate discussions of the stem, bud, leaf, flower, and root and an evaluation of the characteristics useful in identification of sugar-cane varieties. Sources used by Dr. van Dillewijn in preparing this portion of the book consist of the published records of specialists from late in the past century to the most recent years.

Section II, under the general heading "Physiology," contains chapters on germination, tillering, growth, vegetative composition, chemical composition, nutrition, water relations, photosynthesis, and respiration.

For cane growers without access to the large volume of technical literature on sugar cane this book will provide in compact form an excellent, up-to-date, and full account of research on the biology of sugar cane. Of special interest are the careful descriptions of root development and tillering and the progressive development of ratoon crops after the plant cane crop is harvested. For the first time in a sugar-cane handbook space is given to the important growth-regulating substances. The whole treatment of growth processes contains much that is useful in practical manipulation of the crop. The chapters on nutrition and on water relations similarly present fundamental information on fertilizer and water requirements and the interrelation of these factors as they influence growth and sugar production. There are 617 references to technical literature.

E. W. BRANDES

Palm Beach Research Farm
Canal Point, Florida

Short-Wave Radiation Phenomena, Vols. I and II. August Hund. New York–London: McGraw-Hill, 1952. 1382 pp. $20.00 the set.

It is not always easy to formulate a concrete opinion about a book of such tremendous proportions as this 1382-page opus. In the present case, this is even more difficult because it is hard to identify the reader to whom the work might have been addressed. It is cer-