# *Book Reviews*

***The Yeast Cell, Its Genetics and Cytology.*** Carl C. Lindegren. St. Louis, Mo.: Educational Publishers, 1949. 28 chapters. $7.00.

This monograph of the personal researches of Lindegren and his co-workers includes much research and illustrative material that were published in one or more of Lindegren's numerous journal and review articles. Although it is useful to have this work collected, one does not thereby automatically obtain a clear, unbiased, comparative analysis of the veritable mass of investigation on the cytology of yeasts or of the recent surge of work on yeast genetics. This limitation of the book is evidenced by the fact that, of only 243 literature citations, 57 are to papers by Lindegren and co-workers; fewer than half the references are to papers on the cytology or genetics of yeasts. Much important recent work, including that of Lillian Nagel, who has attempted to correlate the main work on yeast cytology and to evaluate a variety of cytological techniques for use with yeasts, has been completely neglected.

The format of the volume is unusual. The pages (there are about 365) are not numbered consecutively but begin anew with each chapter and are indicated as 6–19, 21–5, etc. Numbering of tables and figures is handled in similar fashion. No index is provided, but there is an extensive table of contents. The book is not set from type but is a photo-offset reproduction from typewritten copy. The quality of reproduction of the numerous photomicrographs is generally adequate. Use of arrows or pointers with these would have been helpful. Clerical errors are not infrequent and errors between text references and bibliographical citation are numerous. There are errors of one type or another in over 10 percent of the references. It proved impossible in most instances to associate Lindegren's own work as discussed in the text with any particular paper of his in the bibliography. A passing wave in the direction of the rear of the book was all that could be obtained from such statements as "I (1945)" when there proved to be four papers by Lindegren alone for that year, as well as two with other authors. For references to the work of other authors there was a generally free-and-easy attitude toward such matters as agreement between the year of publication as given in text and in citation, number of names in the authorship (the names might even be transposed), and spelling. References are not provided for figures and tables taken from Lindegren's own work.

The field of yeast cytology may be described as one that has been struggling along for the past 50 years in perpetual need of criteria for determining the nature (composition and function) of the numerous spots, globules, inclusions, and dancing bodies that are to be seen in yeasts. Names for these structures have been produced in abundance (one might say in superabundance in view of the polemics that have raged among yeast cytologists). The author has been especially generous in contributing names for these tiny structures; in chapter 6 he lists nine terms by means of which he currently describes assorted globules, vacuoles, and stainable items. The word "currently" (meaning 1949) is employed designedly to characterize the transient use of terms for cytological entities. The text of a 1946 paper of his has been altered solely by the substitution of the word "mitochondria" for "fat deposits" in Tables 8–2 and 8–3; the 1946 reference for these tables described the "fat deposits" as being detected by microscopic observation of their refractile nature; no cytochemical procedures were employed for this characterization. We are thus indebted to Lindegren for a quick means of locating mitochondria in yeast cells. One merely observes a highly refractile object, labels it "fat deposit," and translates to read "mitochondria." This is not the only instance of word transformation to be found; the "balled-up chromosomes inside the nuclear vacuole" was the description accompanying Fig. 6–23 when it appeared in 1945; these "chromosomes" appeared following the application of Lugol's iodine solution. This simple "chromosome stain" now reveals the same bodies to be "nucleoli."

The author claims that by means of Refalko's modification of the Feulgen procedure (differing from others chiefly in the manner in which sulfite is provided for the dye reduction) "yeast chromosomes were successfully stained for the first time." This reaction has, in the hands of others, given a localization of color in a body which Lindegren terms the "centrosome" and which, he insists, divides by transverse fission, thus ruling out its being a "nucleus." He then detects an additional localization of Feulgen-positivity in minute structures which he equates with the "delicate suspending threads for the central volutin granule" in the historic picture of the yeast cell presented in 1910 by Wager and Peniston. In their highly imaginative drawing these threads are depicted as being 1/315 of the length of the longest axis of the cell; this would seem to indicate that the threads are about 0.02 μ thick. Possibly Dr. Lindegren could find more tangible structures with which to identify his "chromosomes."

Since the material on yeast genetics presented here is largely that already published by Lindegren and co-workers, it does not seem necessary to amplify the extensive critique of these papers published by Winge and Roberts in 1948. The fundamental discoveries of Lindegren and his school on the mating type and its inheritance and the inheritance of characters governing nutritional requirements and fermentative abilities are well known. The weak point in the Lindegren technique of hybridization is the lack of absolute certainty of the parentage of a

zygote. Proof of the parentage, in his technique, is supplied only by genetic analysis; with parentage involving numerous genetic "markers," this can be strong proof, indeed.

We have, then, in this highly provocative volume, a full presentation of the work and views of an original and ingenious investigator studying a group of refractory organisms which seem to promise to supply important information on the relationships between cytological structures, genetic mechanism, and biochemical processes. The book should be read by all students of the genetics and cytology of microorganisms. One may not agree with Dr. Lindegren's views in many instances, but one is almost certain to find much to stimulate thought in this volume.

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***Therapeutische Chemie: Arznei- und Desinfektionsmittel zur Bekampfung von Infektionskrankheiten.*** Theodor Wagner-Jauregg. Bern, Switzerland: Hans Huber; New York: Grune & Stratton, 1949. 272 pp. Sw. fr. 35.50.

This is a valuable résumé of the chemistry of anti-infective agents. It is written in three sections, the first considering antiseptics such as phenolic, halogen-containing, and oxidizing compounds; the second, chemotherapeutic agents such as compounds containing metals, the dyes, and the sulfonamides; and the third, the antibiotics. The approach is chemical, with a concise statement of the history, derivation and relationships, and structure of the compound in question. Following this excellent chemical summary there is in most instances a brief, unqualified statement of the therapeutic claims advanced by the developers of the agent in question. There is seldom any criticism of these claims. For a few drugs—for instance, the sulfonamides and antimalarials—a short review of the pharmacology and practical therapeutics is added.

The book is similar to the excellent American volume, *Chemistry of Organic Medicinal Products*, by Jenkins and Hartung (New York: Wiley, 1949), to which it becomes a welcome and useful partner. It is, of course, limited to anti-infectives and includes some inorganic compounds. It is unlike the British volume, *The Basis of Chemotherapy*, by Work and Work (New York: Interscience, 1948), in that it considers the actual mechanism of action only briefly and occasionally. Wagner-Jauregg is an experienced worker and writer, particularly in the field of the chemotherapy of experimental tuberculosis. The German is easy, the printing and indexing are excellent, and the hundreds of structural formulas well set.

The printing date, 1949, prevents more than cursory statements in regard to the newest antibiotics, but penicillin and streptomycin are discussed in adequate detail, even with inclusion of considerable details of manufacture.

If one were to criticize the book at all it would have to be on the basis of its therapeutic credulity. It should be consulted as a straightforward chemical source, not a therapeutic guide, and for this purpose should be an exceedingly valuable reference.

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## *Scientific Book Register*

***A Symposium on Steroid Hormones.*** Edgar S. Gordon, Ed. Madison, Wis.: Univ. Wisconsin Press, 1950. 396 pp. $6.50.

***German Aviation Medicine, World War II,*** 2 vols. Prepared under the auspices of the Surgeon General, U. S. Air Force. Washington, D. C.: Supt. of Documents, Government Printing Office, 1950. 1302 pp. $8.50 the set.

***Adrenal Cortex.*** Transactions of the First Conference, November 21–22, 1949. Elaine P. Ralli, Ed. New York: Josiah Macy, Jr. Foundation, 1950. 189 pp. $2.00.

***Amphibians of Western China.*** Ch'eng-chao Liu. Chicago: Chicago Natural History Museum, 1950. 400 pp. and 10 plates. $7.50.

***Maya Hieroglyphic Writing: Introduction.*** J. Eric S. Thompson. Washington, D. C.: Carnegie Institution of Washington, 1950. 347 pp. and 64 plates. $7.00 paper; $7.50 cloth.

***Colloid Science.*** James W. McBain. Boston: Heath, 1950. 450 pp. $6.00.

***Statistical Decision Functions.*** Abraham Wald. New York: Wiley; London: Chapman & Hall, 1950. 179 pp. $5.00.

***The Technology and Chemistry of Alkaloids.*** Frank E. Hamerslag. New York: Van Nostrand, 1950. 319 pp. $6.50.

***McClung's Handbook of Microscopical Technique: For Workers in Animal and Plant Tissues.*** 3rd ed. Ruth McClung Jones, Ed. New York: Hoeber, 1950. 790 pp. $12.00.

***Freud: Dictionary of Psychoanalysis.*** Nandor Fodor and Frank Gaynor, Eds. New York: Philosophical Library, 1950. 208 pp. $3.75.

***An Introduction to Nematology: Anatomy,*** Sect. I. Rev. ed. B. G. Chitwood and M. B. Chitwood. Washington, D. C.: B. G. Chitwood, Box 104, Catholic University, 1950. 213 pp. $10.00.

***Soil Fertility and Sewage: An Account of Pioneer Work in South Africa in the Disposal of Town Wastes.*** J. P. J. Van Vuren. New York: Dover, 1950. 236 pp. $4.50.

***Physical Chemistry.*** Walter J. Moore. New York: Prentice-Hall, 1950. 592 pp. $5.00.

***Biological Standardization.*** 2nd ed. J. H. Burn, D. J. Finney and L. G. Goodwin. New York: Oxford Univ. Press, 1950. 440 pp. $6.75.

***The British Smut Fungi* (Ustilaginales).** G. C. Ainsworth and Kathleen Sampson. Kew, Surrey, Engl.: Commonwealth Mycological Institute, 1950. 137 pp. $3.00.