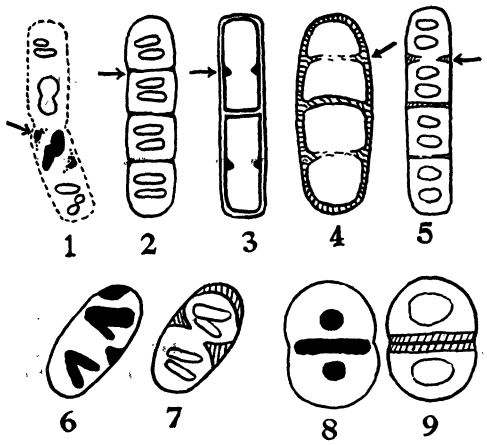

FIG. 1. 1: "Metaphase spindle" in *Bacillus,* according to DeLamater. Drawn after the photomicrograph. This figure is the sole illustration of what is claimed to be the metaphase in the majority of the papers quoted (*1–5*). The "centriole," indicated by the arrow, is seen to be identical with the granules at the junction of the cell wall and cross-walls in 2–5. 2: *Bacillus,* according to Bisset (*6*). 3: *Bacillus,* cell walls according to Knaysi (7). 4, 5: *Bacillus,* according to Robinow (*8*). 4, cell walls; 5, septa and nuclei. 6, 7: *Bacterium coli,* claimed by DeLamater to show mitotic spindle; 6, as seen; 7, showing nuclei, growing tip, and points of division. 8, 9: *Coccus,* showing appearances claimed as mitotic spindle by DeLamater; 9 shows that the "centrioles" are the shrunken nuclei; the "chromosomes" are a cytoplasmic septum.

preparations in support of this contention, however, and it is the experience of the present writer that this method, in common with all dehydration techniques, is very liable to produce shrinkage and distortion in bacteria (*11*).

Of the appearances in other bacteria described by DeLamater, those in *Caryophanon,* which is a very strongly septate organism, are susceptible to the same explanation as in *B. megatherium.* In *Bacterium coli,* the "centrioles" are provided by the material which, in a nonseptate bacterium, corresponds to the septa in *B. megatherium*—i.e. the basophilic areas at the points of division and growing tips of the cell (Fig. 1: 6, 7). In cocci, which frequently possess a central, transverse septum, the shrunken nuclei are apparently seen as "centrioles," the basophilic elements of the septa as chromosomes (Fig. 1: 8, 9).

The facts thus show, fairly conclusively, that DeLamater's claim of having demonstrated mitotic spindles in bacteria is entirely invalid because (*a*) the fundamental fact that most of the bacteria described are multicellular is ignored; (*b*) proper controls for experimental methods are not submitted; (*c*) the evidence utilized to support the contention is exceptionally flimsy and rests very largely upon the repeated publication of a single photomicrograph, claimed to represent a "metaphase spindle," the true explanation of which is shown in the diagrams of Fig. 1.

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Book Reviews

Cold Injury. Transactions of the First Conference, June 4–5, 1951, New York. M. Irené Ferrer, Ed. New York: Josiah Macy, Jr. Fdn., 1952. 248 pp. $3.25.

This volume presents a well-balanced résumé of experimental studies and creative thoughts on cold injury and should be of interest to investigator administrator, and physician. The aim of these conferences is not only to further knowledge about cold injury, but also to promote communication between scientific disciplines. The integration of scientific knowledge, using the multiprofessional approach, is the objective of the Macy Foundation.

Shumacker and Crismon summarize their animal studies in the first two papers. The physiological and biochemical changes occurring in frozen tissue are defined, and the rationale of rapid rewarming is critically discussed. Lewis (R. B.) summarizes his observation on muscle necrosis caused by frostbite and presents his concept of cold injury—namely, that it is due to a lethal effect of cold on tissue and that the vascular system plays little or no part in the process. Behnke, Burch, Blair, and Shumacker defend the role of the blood vessels vigorously. Burton very properly emphasizes the importance that physical factors, such as viscosity of blood, play in the chilled extremity. There is a discussion of the physics and kinetics of water crystallization.

Homeokinesis is discussed by Horvath, and Talbott (the conference chairman) draws on his extensive clinical experience to define the renal and cardiovascular physiology of hypothermia. Dangers during the rewarming period are analyzed.

Kark summarizes the present knowledge on ac-

climatization. Blair presents his observations on acclimitization to cold in animals. This is stimulating work, because he has reproduced frostbite using only low ambient temperatures. The lesions are closely comparable to those seen in man under field conditions. Sellers' studies confirm those of Blair in every particular, and his reproduction of partial acclimatization by thyroxin and cortisone is an important advance.

This book is recommended by three further features: Edholm's discussion of the hunting reaction (the finest since that of Sir Thomas Lewis in 1931), Fremont-Smith's knack of asking pointed questions and of summarizing problems, and the editing of Ferrer. Complete indexing and 185 selected references make it a significant, up-to-date, usable reference book on cold injury.

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Absorption and Extraction. 2nd ed. Thomas K. Sherwood and Robert L. Pigford. New York–London: McGraw-Hill, 1952. 478 pp. $7.50.

This book is a complete and welcome revision of the useful first edition published in 1937. In the intervening 15 years the text has grown from 278 small pages to 478 larger ones, and this increase in size well represents the amount of valuable information added in the new edition.

The authors have been successful in presenting a survey of the field of gas absorption, which relates the work on many diverse aspects of the problem to the main purpose of designing absorption equipment. Except in the case of the most important concepts, the exposition is not detailed. The general outline and the value of the subject matter are presented, and the student is left to work out the details of the subject, or he may consult the references given. In recent years, there has been a tendency in engineering texts to work out every possible problem and save the reader the necessity of looking up or thinking out anything for himself. The method employed in this book is, in this reviewer's opinion, much to be preferred.

The first chapter covers molecular diffusion and generally resembles that of the first edition. The second chapter is new; it deals with eddy diffusion and turbulent flow and is an important addition to the text. Chapter III is concerned mainly with the analogies among heat, momentum, and mass transfer; it contains references to much new data which help illustrate the usefulness of the methods discussed. There is a new chapter on simultaneous heat and mass transfer, and the chapter on the principles of design has been greatly improved and brought up to date. The authors allotted about the right amount of space to coefficients and to transfer units.

The section on the design for multicomponent systems has been changed to include more and better material on equilibrium relations in these systems. The various methods of estimating the pressure drop in towers, the flooding point, and the performance of various types of equipment under different conditions are the subjects of the chapters that follow. The chapter on simultaneous absorption and chemical reaction has been expanded to include much practical data not available in the first edition.

The final chapter on liquid extraction is not as complete as the rest of the book, but even here the authors' knack for summarizing the state of the field is well displayed. There is a short appendix concerned with the economic factors in absorption equipment design. This subject perhaps deserves a little more attention in a book of this kind.

Although the book has been reviewed from the point of view of a graduate text in chemical engineering, it should be added that it is a valuable reference work and should find a place in the library of most engineers.

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Scientific Book Register

The Tertiary Cheilostomatous Polyzoa of New Zealand. David Alexander Brown. London: British Museum (Natural History), 1952. 405 pp. £4 10s.

The Practical Significance of Modern Cardiological Investigations. T. E. Lowe, H. B. Kay, and H. A. Luke. Victoria: Melbourne Univ. Press; New York: Cambridge Univ. Press, 1951–52. 206 pp. $7.50.

Land for Tomorrow: The Underdeveloped World. L. Dudley Stamp. Bloomington: Indiana Univ. Press; New York: American Geographical Society, 1952. 230 pp. $4.00.

Introduction to the Study of Physical Chemistry. Louis P. Hammett. New York–London: McGraw-Hill, 1952. 427 pp. $6.00.

Zoology. Alfred M. Elliott. New York: Appleton-Century-Crofts, 1952. 719 pp. $6.00.

The Exact Sciences in Antiquity. O. Neugebauer. Princeton, N. J.: Princeton Univ. Press, 1952. 191 pp. and 14 plates. $5.00.

Principles of Human Relations: Applications to Management. Norman R. F. Maier. New York: Wiley; London: Chapman & Hall, 1952. 474 pp. $6.00.

Kulturtechnische Botanik. Fritz Jürgen Meyer. Berlin-Nikolassee: Naturwissenschaftlicher Verlag, 1951. 264 pp. DM 9.

Biologische Grundprobleme und ihre Meister. Das Lebensproblem im Wandel der Jahrhunderte. 2nd ed. W. von Buddenbrock. Berlin-Nikolassee: Naturwissenschaftlicher Verlag, 1951. 161 pp. DM 10.80.

Dictionary of Architecture. Henry H. Saylor. New York: Wiley; London: Chapman & Hall, 1952. 190 pp. and 16 plates. $4.50.

Functional Anatomy of the Mammal. A guide to the dissection of the cat and an introduction to the structural and functional relationship between the cat and man. 2nd ed. W. James Leach. New York–London: McGraw-Hill, 1952. 276 pp. $4.50.