the methods employed to measure the osmotic quantities of plant cells and to their limitations.

In recent years many different lines of experimental evidence have suggested that movements of water between living cells involve physiological as well as purely physical mechanisms. The evidence is described and critically evaluated in a long chapter that bears the rather unfortunate title of "Active Cell Water Relations." The authors conclude that information is still too incomplete to warrant any definite conclusions as to the reality of water movements initiated and maintained in living cells by the expenditure of energy in physiological processes.

The remainder of the book (Chapters 9 and 10) deals with the absorption of water by root systems, its transport through the conductive elements, and its loss in transpiration. The treatment is brief but uneven in the thoroughness with which the various processes are discussed. The restricted treatment given soil moisture relations and the physiology of water absorption undoubtedly stems from the recent publication of an excellent monograph on these subjects.

A concise summary terminates each chapter. All citations of literature are in a single extensive bibliography. Text material is supplemented by many figures.

The book can be recommended to advanced students of biological sciences and to teachers as a very useful presentation of the water relations of the higher green plants. It brings together a great deal of information and the sources from which the data have been obtained. It seems unfortunate that so little attention has been given to the structural framework of the plant within which the physiological processes take place. Full comprehension of physiology must depend upon an appreciation of the relationships between anatomy and the activities located in this framework. In orienting their discussion upon one of the components of the plant rather than upon the interrelationships of the organism as a whole, the authors were limited by the restrictions of their point of view and their treatment fell short of completeness. Nonetheless, the book fills an important place in plant physiological literature and its uniqueness of approach gives it a distinctive flavor which will increase its appeal.

DONALD B. ANDERSON

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Blakiston's New Gould Medical Dictionary. Harold Wellington Jones, Normand L. Hoerr, and Arthur Osol, Eds. Philadelphia: Blakiston, 1949. 1294 pp. $8.50.

One must live with a dictionary in order to attempt to assess its real value. This the writer has done for several months and hence offers a somewhat belated review.

A sedulous attempt has been made to develop a dictionary along new lines to cover the broad field of the health sciences. Members of the faculty of Western Reserve University School of Medicine formed the nucleus of specialists charged with the responsibility for words and definitions; to this group were added equally eminent leaders in lexicography.

The selection of the words was made after a diligent search of the current literature not only for new terms but also for evidence of change of usage. The drugs described in the latest revisions and editions of the *Pharmacopoeia of the United States of America,* the *National Formulary, New and Nonofficial Remedies,* and the *United States Dispensatory,* and in the various listings of medicinals bearing trade-marked proprietary or other trade names have been included. In order to do this and yet keep the bulk of the volume manageable, it became necessary "to trim away much that clearly is obsolete and valueless."

Pronunciation is shown by syllable division and accent. Eponyms and biographic references have been included with and handled as part of the vocabulary. The illustrations have been grouped in the center of the volume but they are integrated with the rest of the volume by an adequate system of cross references. The selection of the type is good and the excellent spacing makes for unusual facility in finding the words.

The editors and contributors have succeeded in preparing a most useful book and it can be highly recommended. Their wisdom in the choice for deletion of words, such as *aleuronat,* will be evident only after wide usage. It is a bit disappointing to note the omission (surely not a deletion) of the name of Domagk, Nobel laureate in medicine for his work on the sulfanilamides; the etiologic agent of granuloma inguinale given as *Leishmania donovani*; the word spectrum defined without reference to "microbial spectrum"; the statement under Roux: "first used attenuated bacterial culture (anthrax) therapeutically (1880)"; and the "Calmette test" listed as obsolete. These and other shortcomings will unquestionably be rectified in future editions.

MALCOLM H. SOULE

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External Morphology of the Primate Brain. Cornelius J. Connolly. Springfield, Ill.: Charles C. Thomas, 1950. 378 pp. $10.00.

Every important stage of cortical development from lemur to man is dealt with in this monograph. For his study of the 538 brains from more than 50 species, Dr. Connolly had access to the vast collection of the U. S. National Museum. Few, if any, previous investigators have reported on so large a series or on one in which such accurate information was available even on such details as sex and age.

The subjects discussed are: I. The fissural pattern of the primate brain; II. Encephalometry; III. Development of the cerebral sulci; IV. The brain of the newborn and of children; V. The fissural pattern of the human brain (Negroes and whites); VI. Brain and race; VII. The

relation of the sulci to the cortical areas; VIII. Endocranial casts and brain fissuration; IX. Some sulcal relations in the anthropoid and in the human brain; X. The fissural impressions on the endocranial casts of prehistoric man; XI. On homologies and the origin of sulci.

One is disappointed that the text does not deal with the mesial temporal and mesial frontal surfaces of the brain, where the history of the primate brain is the richest and wherein the secrets of phylogenetic development are most effectually concealed. The reason given for this omission is that ". . . it was not desirable to separate the hemispheres in this series" (p. 253). Insofar as the study goes, however, it is a thorough and dependable one, reflecting Dr. Connolly's wide experience in the field. The effort he expended on detail was immense and was wisely channeled into one phase of the over-all subject, namely, the geography of the fissures; his illustrations of the fissures are true and effective, for he has used the Schwarz stereograph in portraying them. Indeed, all of the 337 illustrations are excellent. The bigger problem of the relationship of thalamic development to the configuration of the gyri (of which the fissures are mere boundaries) is not dealt with. His description of endocranial casts of anthropoids and of prehistoric man constitutes an interesting chapter, but interpretation is scanty. The fissural pattern in fetal and adult human brains is treated at some length, as are also the differences in fissuration in Negroes and whites. It is curious that no reference could be found to the duplication of the central sulcus, described in 1882 by Giacomini, in 1907 by Tricomi Allegra, and in 1929 by Gerlach and Weber.

The documentation of the work is admirable. Only here and there can one find instances in which the works of the past could have been put to greater use—for instance, Kuhlenbeck's interesting interpretation of the significance of the lateral occipital gyri (p. 249).

Dr. Connolly's writing is terse and always to the point. His facility of expression makes the text read like a narrative. It is altogether a splendid piece of work.

WEBB HAYMAKER

Armed Forces Institute of Pathology

Illustrated Study Aid for Medical Bacteriology. Walter J. Nungester and Phebe G. Williams. Ann Arbor, Mich.: Edwards Brothers, 1949. 71 pp. $2.00.

This is a picture book. At first glance one might think it had little place among medical texts, but even slight perusal shows that it will take its place as an outstanding supplementary textbook in bacteriology.

Although the preface states that this is "strictly an experiment" it is the reviewer's opinion that the work in its present form has evident value for students studying medical bacteriology and immunology, postgraduate groups reviewing this subject matter, and teachers wishing to use the pictorial material for the preparation of lantern slides or directly on opaque projectors.

The technique of summarizing facts in charts and diagrams is here followed to its logical conclusion. It appears that few, if any, aspects of bacteriology cannot so be treated, as evidenced by the major divisions of the book: Types of Pathogens, Classification, Distribution and Spread of Pathogens, Disinfectants, Infection and Resistance, Immunology, Laboratory Diagnostic Procedures, Chemotherapy, Review of Diseases, Techniques and Methods.

Under each major heading is found a group of related charts and diagrams. Most are self-explanatory; a few assume some knowledge on the part of the reader, and all provide the nucleus of more or less extended discussion, depending on the group interest. The section previewing diseases has the most charts—40 out of a total of 131. The chart of each disease summarizes the pathology, nature of the pathogen, clinical and laboratory diagnosis, treatment, spread and prevention.

The potentialities of this work well warrant the extended version that the authors contemplate.

STANLEY MARCUS

University of Utah, College of Medicine

Clinical Pathology: Application and Interpretation. Benjamin B. Wells. Philadelphia-London: W. B. Saunders, 1950. 397 pp. $6.00.

The first laboratory employing the microscope for the diagnosis of infectious diseases was established by Pasteur at Alais in 1865, in connection with his investigations on pebrine of silkworms. The malady was controlled by destroying the ova of moths found infected by microscopic examination. In order to put this procedure to practical use, girls were taught how to make the necessary examinations. In this way the training of laboratory technicians was included as a function of the diagnostic laboratory at a very early date. Seventeen years later, Koch, in his monumental work on tuberculosis, called attention to the necessity of microscopic examinations of sputum for the tubercle bacillus, to confirm diagnosis of pulmonary tuberculosis. The teachings of these two gave to the diagnostic laboratory its true place in medicine.

Clinical pathology was not generally accepted as a specialty in the United States until the second decade of the present century. The wider application of serological methods, a multiplicity of biochemical tests, the assay of hormones and vitamins, and the determination of susceptibility and resistance of microorganisms to the sulfanilamides and antibiotics necessitated the bringing together of individuals skilled in the various branches of serology, biochemistry, endocrinology, and bacteriology to carry out the multitude of highly specialized techniques. The connecting link between these laboratorians and the practicing physician is the clinical pathologist; trained in medicine and skilled in the interpretation of the results obtained by the experts, he brings to the clinician a clearer understanding of the value and limitations of laboratory findings as they affect the patient.

It is essential for the physician to know what laboratory procedures are available and what they may contribute to the problem confronting him. The book by Wells will provide this information. There are nine chapters, the first seven of which deal with: laboratory procedures generally applicable to the study of infectious diseases, diseases of the gastrointestinal system, diseases of the re-