BOOK REVIEWS

The ABC of Acid Base Chemistry. By HORACE W. DAVENPORT. Price $2.00. Pp. 74, 40 figures, and 17 tables. Ed. 2. University of Chicago Press, 1949.

The subtitle of this book is "The Elements of Physiological Blood-Gas Chemistry for Medical Students and Physicians." The purpose of the book as stated in the introduction is "to provide medical students and physicians with a comprehensive and intelligible outline of the elements of physiological acid-base chemistry." The author states that the subject is difficult to comprehend and that the presentation, while far from traditional and at first sight tedious and complex, has been used successfully for years at several medical schools in the United States. The reader is expected to be well grounded in the fundamentals of biochemistry and physiology. Several liberties are admittedly taken with strict simplicity and clarity. The book itself is bound with heavy paper binding which appears quite durable. The lithoprint process has been used for the written material and the figures, all of which are quite legible.

The first impression one obtains of this book is the overwhelming mass of mathematical and algebraic computations which are performed. The reader must not allow himself to be distracted from the subject matter by these calculations. In general, the chapters are made up of a brief discussion of physiologic principles, followed by the algebraic expression of these principles. At the end of each chapter a problem is worked out as illustration. These problems are well thought out and serve their purpose most adequately. Numerous figures or graphs showing careful preparation and clever originality are employed for similar illustrative purposes.

The early chapters of the book deal with the transportation of the respiratory gases to and from the tissues and the buffering action of oxidized and reduced hemoglobin. Using the value for the hydrogen ion concentration of the blood and the total carbon dioxide of the blood as found by analysis, the method of calculation of the partial pressure of carbon dioxide, plasma carbonic acid and plasma bicarbonate is explained. A monogram is used to simplify these calculations. From these data the "pH-bicarbonate diagram" is developed.

This diagram graphically relates the blood hydrogen ion concentration to the plasma bicarbonate concentration. Curves are plotted for these variables using constant partial pressures of carbon dioxide. On a similar diagram the buffer curves are plotted using samples of blood equilibrated with varying partial pressures of carbon dioxide. By means of these buffer curves the buffer values of true plasma, separated plasma, reduced and oxygenated true plasma are illustrated.

By superimposing the pH bicarbonate curve at the physiologic partial pressure of carbon dioxide upon the buffer curve of true plasma, the effects of addition of fixed acid and base and of respiratory and metabolic acidosis and alkalosis are shown. The compensatory mechanisms for acid-base disturbance are described. The four states of acid-base disturbance are then illustrated by a presentation of clinical examples.

Because of the technical difficulties inherent in the method of obtaining the value for the hydrogen ion concentra-

tion of the blood, an alternate method of appraising the acid-base state is given. The content capacity diagram is substituted for the pH bicarbonate diagram. To use this content-capacity diagram only the values of the carbon dioxide content of arterialized blood plasma before and after equilibration with carbon dioxide at a partial pressure of 40 mm. are required. The errors inherent in the methods of obtaining these values are pointed out.

Lastly, the author describes useful laboratory methods for (1) the drawing of blood, (2) measuring the hydrogen ion concentration, (3) centrifuging blood and (4) equilibrating blood.

This book evidently has been written to serve as a guide in the teaching of a course in acid-base chemistry. Lectures or discussions must be used to supplement the material in the book. The mathematical preciseness with which acid-base chemistry is explained is to be admired. However, acid-base chemistry cannot be accurately evaluated clinically by laboratory determinations of the hydrogen ion concentration and bicarbonate values, nor are such determinations always necessary. Moreover, in severe air-base disturbances it may be necessary to determine the total electrolyte pattern of the blood. The presentation of basic physiology is difficult and is tedious to read. Admittedly, there is no easy way to learn acid-base chemistry. This book will be of value to students, whether they be undergraduates or graduates, if they are engaged in the study of acid-base balance.

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Blakiston's New Gould Medical Dictionary. EDITED by HAROLD W. JONES, M.D., NORMAND L. HOERR, M.D., ARTHUR OSOL, PH.D., an eminent editorial board and 80 additional contributors. Three editions: textbook $8.50, thin paper $10.75 and deluxe $13.50. Pp. 1294 and 252 illustrations (129 in color). Philadelphia. The Blakiston Company, 1949.

The book not only covers all branches of medicine and allied sciences exhaustively but includes medical physics, dentistry, pharmacy and other related fields. The illustrations are bound in the center of the book as an atlas. The plates are well prepared anatomical charts and drawings.

A unique feature is the combining of a system of modern phonetic respelling syllabification to give alternate pronunciations. Many words not usually found in medical dictionaries have been included and very short biographical notes of scientists and physicians whose names are associated prominently with medicine have been added. The appendix contains an extensive list of useful tables. Printing is excellent with easy to read text. This new venture in providing a more comprehensive book of this nature will surely be welcomed and prized by students and others having need to use such a book. It should set the pattern for some time to come in the preparation of such a volume.

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