

The Anesthesiologist's Bookshelf

Edited by MEREL H. HARMEL

Applied Respiratory Physiology. By J. F. NUNN. London, Butterworths, 1969. Pp. 438. \$19.50.

This book resembles a chomosome: a skein of vital information adapted to almost indefinite replication and translation. It is an authoritative digest of the massive knowledge of human respiration that has accrued in the last 25 years, and will be indispensable to student, teacher, physician and research worker alike.

Lucidly, in 12 chapters and 80 sections, and with "unashamed emphasis on anaesthesia," the author marshals and explains the clinically relevant discoveries concerning the mechanics and regulation of air exchange, the pulmonary distribution of gas and blood, the physiology of carbon dioxide and of oxygen. His gift for clear exposition is further manifest in the discussions of measurement which complement each chapter. The 600 references at the end of the volume constitute an excellent and up-to-date introduction to the literature. Perhaps the historical roots of applied respiratory physiology are still too short to merit a chapter of their own, but Professor Nunn does cast enough refreshing backward looks at the well-springs to make the reader wish for more.

The book's objective is "to bridge the gap between pure respiratory physiology and the treatment of patients," and John W. Severinghaus' foreword, itself superb, aptly remarks how brilliantly Nunn has succeeded. Nevertheless, a few critical comments are called for.

In a work of character not all the author's foibles can remain hidden, and one that emerges with insinuating iteration is Nunn's way with equations: he writes them in words wherever possible. It makes them easy to read, but not to understand, unfortunately. To assimilate an equation, even the simplest equation, properly, the reader must execute mental gymnastics with the terms. Such exercises are greatly facilitated by the use of symbols, especially where these have been codified as in respiratory physiology. Physicians who have not mastered the now-standard abbreviations will have a hard time keeping abreast of their journals. So I think Dr. Nunn, on the whole, does his readers a disservice by insisting on full-length words and phrases when simpler symbols are available. On the other hand, he exploits the verbal economy of pictures with great

skill in many deft drawings and graphs. Good examples are his sketches explaining the waterfall effect of the pulmonary vascular resistance and the muscle spindle response to changes in airway resistance.

But the figure purporting to depict the relation of surface tension and transmural pressure fails to explain why surface tension creates a pressure gradient across the alveolar-capillary membrane in favor of transudation. How surface tension that tends to collapse alveoli converts to pressure that tends to squeeze liquid out of the capillaries is by no means obvious. The figure also twice misprints pressure units as "dyne/cm." In other respects, the section on surface tension, surfactant and elastic recoil of the lung is a model of clarity, and the exposition of pulmonary hysteresis as observed by the anesthetist is particularly good.

Considering their practical importance to the anesthesiologist, the laryngeal mechanisms of spasm, stridor, and cough receive excessively short shrift: barely one line. The discussion of mechanical ventilators follows Mapleson in recognizing two main types, pressure generators and flow generators, but elects to refer to the latter under the cumbersome and confusing heading of flow-limited pressure generators. Nunn points out that the distinction between end-expiratory gas and ideal alveolar gas is important to the understanding of deadspace. Yet he leaves the distinction murky for lack of a defining equation, which in his usage might read:

$$\begin{array}{l} \text{gas from} \\ \text{perfused alveoli} \end{array} + \begin{array}{l} \text{gas from} \\ \text{unperfused alveoli} \end{array} \\ = \text{end-expired gas}$$

$$\begin{array}{l} \text{ideal alveolar gas} + \text{alveolar air} \\ = \text{end-expired gas} \end{array}$$

Another surprising deficiency is the absence of a clear derivation of the shunt equation. The derivation ostensibly given in Figure 85 is really no derivation at all.

The problem of what to leave in and what to leave out must have been exceptionally difficult in the chapter on oxygen. The decision to omit consideration of the ATP/ADP ratio from the discussion of the role of oxygen in the cell must have been taken reluctantly, and was, I think, mistaken. To say simply that "the ATP/ADP ratio is an in-

dication of the level of energy carried in the ADP/ATP system" is not much of an explanation to the uninitiated.

But these are isolated lacunae that stand out because of the excellence of the material in which they are embedded and do not alter the fact that this volume constitutes a masterpiece of clinical physiologic exposition. Every reader of this review should hasten to acquire and study a copy. Would-be borrowers are likely to be disappointed. Few owners will want to risk losing theirs.

B. RAYMOND FINK, M.D.
Professor and Director
Research Laboratories
Anesthesia Research Center
Department of Anesthesiology
University of Washington
School of Medicine
Seattle, Washington 98105

Principles and Practice of Inhalation Therapy.

By JIMMY ALBERT YOUNG and DEAN CROCKER.
Chicago, Year Book Medical Publishers, Inc.,
1970. \$10.95.

The prominent position and outstanding experience of these authors has made the publication of this textbook an event eagerly awaited. It is doubly disappointing, therefore that poor organization and very careless editing detract significantly from the value of this volume.

The authors state in the preface that the book is an outgrowth of the course structure of an Inhalation Therapy training program. This is made evident by the free use of rhetorical questions and colloquial expressions.

There are a number of errors in almost every chapter. For example, on page 21 the definition of the carina is clearly confused with that of the hilum of the lung. On page 22, the heart is placed on the left hemithorax, rather than in it; on page 28 air uptake should read air intake. On page 31 this reviewer failed to understand the meaning of the second paragraph under the heading "Inspiratory Center." On page 33, maximum breathing capacity is given as 90 l. per minute.

Chapter III, "Respiration and the Atmosphere," has "Composition of Air" as its first subheading. Under this subheading a number of topics are included—such as temperature, pressure, gas transport in the blood. The one topic which is only mentioned in passing is "composition of the air." The remainder of this chapter deals with such assorted subjects as hyperbaric oxygenation, circulation and electrocardiography.

In Chapter IV, "Manufacture, Transport and Storage of Gases," a discussion of the gas laws is

sandwiched in between "Recommended Safe Practices" and "Regulatory Authorities."

In Chapter V, Thomas Beddoes is claimed to have used oxygen for the first time in therapy in 1880. This seems unlikely since Beddoes died on Christmas Eve in 1808 and almost certainly was not the first to use oxygen therapeutically.

In Chapter VI, on page 96, the principles of ultrasonic nebulization are not clear, and on page 99 the term "Glossary" is clearly an error for "Appendix."

In Chapter VII, "Sterilization," no mention is made of the dangers of ethylene oxide sterilization and the essential requirement of aeration after sterilization is omitted.

The chapter on Chest Physiotherapy is excellent, but it is regrettable that no mention is made of the benefits of cooperation between the physiotherapist and the inhalation therapist.

The discussion of mechanical ventilators (page 215) is said to be taken from Mapleson, but no reference is given at the end of the chapter.

The chapters on pulmonary function testing and environmental control systems are satisfactory. The chapter on "order writing" is excellent, and this is the first book to present this important subject in detail.

The final chapters on national organizations and educational requirements are important; it is a pity that both of these areas changed materially while this book was in press.

One of the greatest pleasures of a reviewer is to be able to welcome an important new contribution in an area where there is little satisfactory printed material available. The inhalation therapy literature is extremely limited, and the only complete textbook is "Fundamentals of Inhalation Therapy," by Donald F. Egan. The "Inhalation Therapy Procedure Manual" by DeKornfeld and Gilbert was not intended to be used as a textbook, and the soft-cover "Introduction to Inhalation Therapy" by Stanton Belinkoff is good but not sufficiently detailed.

The inhalation therapy book market is rapidly increasing, and the growing number of inhalation therapists are the most avid book-buyers of any group in this reviewer's experience. Many of them actually read the books they purchase.

It is to be hoped that a second edition of Young's and Crocker's work will rectify the irritating editorial mistakes and will take the place in the literature of inhalation therapy it would deserve.

THOMAS J. DEKORNFELD, M.D.
Professor of Anesthesiology
University Hospital
University of Michigan Medical Center
Ann Arbor, Michigan 48104