spiratory system, diseases of the kidney and urinary tract, diseases of the blood, diseases of the cardiovascular system, and metabolic and endocrine disorders. Chapter eight deals with clinical laboratory studies in surgery and chapter nine with clinical laboratory studies in obstetrics. In an appendix, the author, with the assistance of A. E. Moon, has presented a rounded-out discussion of laboratory aids in symptom diagnosis.

The book is well written and the author has selected wisely among the plethora of tests now available. Although the volume is neither a textbook nor a laboratory manual it is highly recommended for the practicing physician and the medical student.

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Haemoglobin: A Symposium Based on a Conference Held at Cambridge in June 1948 in Memory of Sir Joseph Barcroft. F. J. W. Roughton and J. C. Kendrew, Eds. London: Butterworths Scientific Publs.; New York: Interscience, 1949. 317 pp. $8.50.

Sir Joseph Barcroft was remarkable at least as much for his human qualities as for his outstanding scientific achievements. In his courage, vitality, and enthusiasm, and his affectionate understanding of other human beings, he aroused in his associates personal loyalty and devotion that is given to few scientists. He died suddenly in 1947 at the height of his activity, although he had been retired from his professorship for ten years, and the depth of his influence can be felt in reading the proceedings of this conference, which give a vivid and comprehensive summary of our present knowledge of hemoglobin.

The volume opens with personal tributes to Barcroft, and reminiscences, by E. D. Adrian, Sir Henry Dale, A. S. Krogh, C. G. Douglas, A. V. Hill, R. A. Peters, G. S. Adair, and F. J. W. Roughton. All are admirable and well worth reading, both for those who knew Barcroft personally and those who did not. They help to round out the picture of the man that one obtains from his own vividly written books and papers.

The rest of the present volume is concerned with current investigations on hemoglobin, many directly inspired by Barcroft himself. Here it is impossible even to mention all. Important considerations on the fundamental structure of hemoglobin are advanced by L. Pauling, J. Wyman, Jr., M. F. Perutz, and several others. J. C. Kendrew presents important conclusions, derived from x-ray studies, on the crystal structure of horse myoglobin. The molecule appears to consist of a single layer of folded polypeptide chains, with the plane of the heme group nearly at right angles to the protein layer. This corresponds to Perutz's four-layer structure for horse hemoglobin. Kendrew and Perutz also supply a helpful general discussion of x-ray crystallography of biological macromolecules, addressed to the nonexpert. Important data on amino acid composition are given by G. R. Tristram and by A. Rossi-Fanelli. R. R. Porter and F. Sanger discuss the terminal amino groups of the peptide chains of several hemoglobins, with interesting zoological correlations. E. M. Jope gives valuable data on absorption spectra. There are several studies on the important problem of the differences between adult and fetal hemoglobins; notable are the solubility studies of H. M. Jope and J. R. P. O'Brien, and of M. J. Karvonen. G. S. Adair, and H. Gutfreund, discuss important osmotic pressure studies. H. Barcroft, Q. H. Gibson and D. C. Harrison, and also W. N. M. Ramsay, have valuable contributions on ferrihemoglobin (methemoglobin) in normal blood and in disease. C. Rimington discusses the biosynthesis of heme. F. J. W. Roughton, J. W. Legge, and P. Nicolson present briefly their new data on the kinetics of hemoglobin in solution and in the red cell, and Roughton treats the intermediate compound hypothesis, with conclusions differing in important respects from those of Wyman; these and other disagreements which the reader will note in the book should stimulate further research. D. L. Drabkin describes his work on the accurate determination of the oxygen dissociation curve; H. E. Davenport describes the extraordinary hemoglobins of the worm *Ascaris*, and H. P. Wolvekamp discusses hemocyanin.

Many of these papers briefly present conclusions published elsewhere in greater detail. Others give information which as yet can be found nowhere else. Every contribution deserves close attention, and, in spite of its high price, the book can be recommended most warmly to everyone interested in the structure of this extraordinary class of macromolecules. It is a worthy tribute to Barcroft, whose living influence inspired the conference and the book which issued from it.

JOHN T. EDSALL

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Malariology: A Comprehensive Survey of All Aspects of This Group of Diseases from a Global Standpoint. Mark F. Boyd, Ed. Philadelphia-London: W. B. Saunders, 1949, 2 vols. 1643 pp. $35.00 a set.

The reviewer cannot do better than quote, as the purpose of this book, the opening sentence of the foreword: "It has been the Editor's intention to make this volume a working manual of malariology, a comprehensive and adequate review or factual survey of all available knowledge relating to malaria objectively presented and brought down to date."

This objective is reached with the aid of 65 contributors who have dealt with the problems of malaria from either an abstract or practical standpoint. There are 70 chapters grouped in five sections as follows: Section I. Introduction, one chapter; Section II. Parasitology, eight chapters; Section III. Definite Hosts, 15 chapters; Section IV. Intermediate Host, 25 chapters; Section V. Control and Eradication, 21 chapters. In Appendix I, the equipment for field and laboratory investigation is listed with descriptions and available sources. Appendix II is captioned: Provisional Directory of Manufacturers and Distributors of Equipment and Supplies for Anti-Anopheline Operations. The author and subject indices are unusually comprehensive, occupying 153 pages. The first 31 chapters are in Volume I; Chapters 32–70, with the appendices and indices, compose Volume II.

The prodigious toil of editing 1,477 pages of text was mitigated for Dr. Boyd by his enthusiasm for his subject and the satisfaction of knowing he was making available in this book an encyclopedic coverage of malaria on a global basis, tinctured by the richness of his own experience. As the reader passes from chapter to chapter the expected conflicts in views and contrasts in expression are not encountered because of meticulous attention to detail in editing and selection of the figures.

The great merit of this monograph is that it assembles in compact form all that is really known about malaria.

MALCOLM H. SOULE

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Physiology of Heat Regulation and the Science of Clothing. Prepared at the request of the Division of Medical Sciences, National Research Council. L. H. Newburgh, Ed. Philadelphia-London: W. B. Saunders, 1949. 457 pp. $7.50.

Much credit is due the editor who has assembled under a single cover this authoritative, definitive, thoroughly integrated, and instructive series of chapters, contributed with apparent enthusiasm by scientists, all eminent in their own fields. The book will well serve as comprehensive reference material in the fields of heat regulation and environmental physiology. It will present to the heating and ventilation engineer and to the architect the complete relationship between many factors, both physical and physioligical, that reflect on man's health, comfort, and efficiency in any climatic environment. Finally, it will offer the clothing designer and materials engineer a rationale which can readily replace much of the empiricism so prevalent in their professions in the past.

The book is divided into two parts, the first a series of nine chapters on "Human Response to the Climatic Environment," the second three chapters on "Clothing, a Thermal Barrier."

The opening chapter by Wulsin immediately excites the reader's interest by outlining the many sociological and anthropological factors involved in adaptation to cold and hot climates among non-European peoples, such as the Eskimo, the Mongols, the Fuegians, and those tribes living in the Near East, the Sahara, southeastern Asia, and Central America. One leaves this chapter wondering *why,* in terms of physics and physiology, these peoples react to their climatic environment as described. The succeeding chapters provide a partial answer to this question. The biophysics of thermal exchange between man and his environment is described very clearly in chapters by Yaglou and Hardy. Then follows a long, analytical, original, and masterly chapter by Bazett on temperature regulation. Various aspects of physiological adjustment to heat and cold are covered in chapters by Robinson, Spealman, Day and Herrington. The first part ends with a chapter by Yaglou on indices of thermal comfort.

The second part of the book essentially attempts to reduce the problem of adequate clothing to a rational use of physical formulas, of insulating materials produced by man or animal, and of climatic data associated with various geographical areas. Fourt and Harris adequately cover the physical properties of clothing fabrics. Then follows a long chapter comprising a series of essays introduced by Forbes and prepared by Adolph, Robinson, Belding, Spealman, Van Dilla, Day and Siple. Each essay describes, in terms of the particular interests of its authors, laboratory and field methods of evaluating physical and physiological properties of complete clothing assemblies on and off man. The second part concludes with a unique chapter by Siple relating the principles of clothing design to occupational specialty and climate.

At the end of the book is an appendix with definitions of new and old concepts such as *caloric content, Clo, effective temperature, mean skin temperature, net metabolic cost,* and *wind chill.* The appendix also includes miscellaneous information on the metabolic cost of various activities and concludes with a useful conversion table between thermal factors in the cgs system conventionally used by scientists and in the British system generally used by engineers and laymen.

Because of its varied authorship there is some duplication of fact and formulas, all of which may be necessary to make each chapter reasonably complete. The editor has quite wisely allowed each author free reign as to opinion and presentation. As the editor points out in the introduction, the book does not presume to give final answers. Since the manuscripts for this book were prepared, new studies have been reported in the literature, by both military and civilian groups, that can well supplement and clarify this information.

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Physiology of the Eye: Optics, Vol. 1. Arthur Linksz. New York: Grune & Stratton, 1950. 334 pp. $7.50.

Optics: The Technique of Definition. Arthur Cox. New York: Pitman Publ., 1949. 412 pp. $5.75.

On first thought it seemed illogical to review these two books together, for they cover different material and their purposes and approach are not at all alike. There is, however, a certain similarity between them. Each book is written for a specialized purpose: the one for the student ophthalmologist who should be well acquainted with the properties of light and the laws of optics as they concern the human eye; the other for the thoughtful individual who wishes to understand all about the photographic lens, or "eye" of the camera. Either reader would profit by reading both books, and would thus become aware of the many properties shared by the human eye and the camera.

The first volume is the outcome of Dr. Linksz' long experience in teaching this subject to those of the medical profession who intend to specialize in ophthalmology. The book opens with an introductory section on physical optics, the wave and corpuscular natures of light, spectra, the photoelectric effect, and photometry. The large central portion of the book gives a detailed presentation of geometrical optics, and concludes with a discussion of the eye as an image-forming mechanism. The style is most