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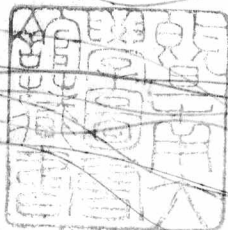
# Physiology in Health and Disease

BY

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## PREFACE TO FIFTH EDITION

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THE first edition of this textbook (1934) presented a thorough discussion of the functional organization of the body and its parts and attempted as far as possible to explain physiological mechanisms in accordance with established laws of fundamental sciences. In addition, a serious effort was made to compare experimental reactions which can be induced in normal organisms with aberrant reactions that occur in disease. As implied in the title, equal emphasis was given to basic physiology and the application of physiological principles to medical practice.

To meet the somewhat different demands of medical students, clinicians, investigators, and progressive practitioners of medicine, it was deemed important to avoid dogmatic statements and to include more than a tidal volume of physiological knowledge. Controversial subjects were presented fairly, and all material was documented by convenient footnote references in addition to lists of pertinent monographs and reviews at the ends of chapters. The text was implemented with an ample workable index. The author has adhered to these basic principles in this revision as in previous ones.

In view of continuing contributions to physiology through steadily improving methods and techniques and the ever-changing interpretations which they occasion, no textbook can continue to serve these purposes unless it is frequently revised. The word, "revised," incorporates the idea of again examining facts, statements, organization of material, etc., with the idea of bringing them into conformity with new discoveries as well as with new viewpoints in correlative medical education. A mere patchwork of new material upon the old does not constitute revision; new material must be blended and amalgamated with the old and yet constitute a connected narrative. To accomplish these aims the entire text was revised and approximately one-third was entirely rewritten. More than 1,000 new references have been incorporated; of the 280 illustrations, 60 are new.

Particular attention may be called to expanded and new sections involving different fields of interest. Of importance in basic physiology is the inclusion of new matter relating to biophysical subjects such as bioelectric currents, oxidation, muscle contraction, impulse transmission, hemodynamics, blood flow through special organs such as the brain, kidney, liver, spleen, heart, and lungs; also physiological optics, hearing, physical processes concerned in secretion, absorption and translocation of fluids and electrolytes, dynamics of urinary secretion, etc. For correlative purposes the material dealing with intermediary metabolism, vitamins, and endocrines has been somewhat amplified.

Of special clinical concern are new or revised discussions of subjects having daily interest, such as pain, headache, paralysis, spasticity, coagulation and anticoagulants, blood volume, dyspnea, coronary occlusion, hypertension, dynamics of valvular lesions, edema, pulmon-

ary edema and embolism, gastro-duodenal ulcer, diabetes, fever, bed rest, conditioned reflexes, and experimental neuroses. A whole chapter is devoted to the physiological basis of psychosomatic reactions.

It was deemed important for many reasons to retain an exposition of problems related more specifically to various phases of war physiology. Discussions of subjects such as hemorrhage, shock, and transfusion, the effects of anoxia, decompression and acceleration, adaptations to environmental factors such as motion, heat, cold, deprivation of water and food, etc., have all been thoroughly revised.

In order to include the vast amount of new material and yet not increase the size of the book to bulky proportions, many topics and sections have been rearranged, rephrased, condensed, or placed in smaller type, and a few subjects which are of less current interest or treated in available special monographs have been omitted. It is hoped that these procedures have also increased the general usefulness of the book.

The revision of the text has been aided materially through its use in our medical classes. The authoritative exposition of advances in different fields, as presented in many monographs and reviews, has proved a substantial help. Of these, Annual Reviews of Physiology deserves particular mention. The process of revision has been facilitated no less by substantial assistance from various members of my staff. The author is particularly indebted to Dr. David F. Opdyke for assistance in revising the section on endocrinology, to Dr. Ewald E. Selkurt for aid in revising the text dealing with blood coagulation and for amplification of chapters dealing with renal physiology and tissue fluids, to Dr. Robert S. Alexander for help in recasting chapters dealing with the physiology of axons, reflexes, blood gases, and the chemical and nervous control of respiration. Dr. Harold C. Wiggers contributed the material for a section of Chapter LIII dealing with physiological effects of immobilization and bed rest. Dr. Enrique Ecker is responsible for revision of the section in Chapter XVII dealing with hemagglutination and blood grouping. Mrs. C. J. Wiggers rendered valuable service in connection with correction of the manuscript, and Miss Jeanette Ingersoll, my secretary, again deserves commendation for the many types of service rendered in connection with the revision. To these and others too numerous to mention by name, gratitude and thanks are due.

The author wishes to thank the publishers, Lea and Febiger, for their splendid cooperation and, in particular, for their generosity in permitting repeated new additions to the proof, thus reducing greatly the hiatus which naturally exists between enunciation of new work and its broadcast through the medium of textbooks.

In conclusion, the author desires to express his appreciation of the reception accorded previous editions and hopes that, as a fifth edition, it may continue to serve earnest medical students and investigators, as well as clinicians and practitioners of modern medicine.

CARL J. WIGGERS

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