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# HEART DISEASE

*By*

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*THIRD EDITION*

*Completely revised and reset*



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## PREFACE TO THE THIRD EDITION

The first edition of this book was published in 1931, the second in 1937. It is now my duty and pleasure to present a new revision, not only because of the advances in the study and treatment of heart disease that have taken place during the past six years but also because of the continued demand for a systematic survey of this type. The arrangement of the book has proved to be fundamentally sound and useful, and hence in the main it has not been materially altered, but many passages have been added, amplified, omitted, or changed in accord with our current knowledge. Obscure and debatable subjects are surrounded as little as possible with a fog of words, interesting as it may be to argue pro and con; in this volume they are dismissed with remarks which summarize what we know and what we don't know about them which is, I am sure, a far sounder plan in the long run. Most of the unanswered questions asked in the appendix of the first edition remain today without adequate answer; a few, namely, numbers 9, 10, 13, 15, 24, 26, 31, 44, 48, 52, 57, 64, 65, 67, 68, 70, 77, 83, 84, 86, 93, and 97, have had in full or in part some sort of a solution which may be found in the present volume by referring to the index.

An important addition in this revision of the book is Chapter 1, The Range of the Normal Heart, which was first presented in modified form as a Mayo Foundation Lecture at Rochester, Minnesota, on February 27, 1941. The more important paragraphs of the previous short Chapter 1, entitled Introduction, have been incorporated at the beginnings of Chapters 2 and 3. Other important additions to the book have been a new section on Phonocardiography in Chapter 5, incorporation of Precordial Leads in Chapter 9, a discussion of ligation of the patent ductus arteriosus in Chapter 12, of the present status of the treatment of subacute bacterial endocarditis in Chapter 13, and of splanchnic resection for hypertension in Chapter 18, new sections on Military Service, Gastrointestinal Diseases and Disorders, and Miscellaneous Conditions in Chapter 22, a new section on Intracardiac Thrombosis in Chapter 25, a new section on Pulmonary Embolism in Chapter 27 and notes in that same Chapter on other vascular accidents throughout the body, a new section on the Circulation of Blood in Chapter 28, and comments on extreme tachycardia occurring paroxysmally in infants in Chapter 32.

Because of the regret of many readers over the omission from the second edition, to save space, of several quoted historical references

that constituted an interesting innovation in the first edition, there has been a replacement of the more important of these references in this new edition, along with the addition of several others that are significant although but little known or recognized in modern writings. These additions have been made without materially adding to the bulk of the volume, but with enhancement of its value.

More illustrations have been added either to emphasize new facts or to replace old figures of less merit. New references to publications of importance or current interest that have appeared in the cardiovascular literature during the interval of six years since the preparation and publication of the last edition of this book, that is, from 1937 to 1943 inclusive, have been added after each chapter with a few earlier references inadvertently omitted previously, while many of the references of current interest in the years 1931 to 1936 inclusive have not been reprinted; those of greatest interest before 1937 are retained, however, as a useful background. The reader is referred to the first two editions for a more complete bibliography of publications prior to 1937. Because of the great war now in progress the list of new references is perforce much more limited in its geographical distribution than in the other editions, being in major part from North and South America and from Britain.

I take great pleasure in acknowledging the help of my secretary Helen Donovan in the tedious preparation of the manuscript, of my wife and of Louise Wheeler in checking the bibliography and in the correction of the proof, of Wilbour Lown, photographer, and of Muriel McLatchie, artist, at the Massachusetts General Hospital, in supplying new illustrations, of my close associates Howard B. Sprague, Edward F. Bland, and Ashton Graybiel, and of my other colleagues of Boston and elsewhere who have freely given me their advice, and of the publishers themselves in the preparation of this new edition during the trying days of the second World War.

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July, 1943*

## PREFACE TO THE SECOND EDITION

Five years have elapsed since the publication of the first edition of this book. Although there have been in this interval of time no great or fundamental changes in the diagnosis or treatment of heart disease, significant advances have been recorded in so many details that a complete revision of the book has proved desirable. It is the author's hope that this new edition may be as useful as was the first, and because of its smaller size more available to medical students.

The arrangement of the first edition was a departure from the customary one of volumes devoted to a discussion of heart disease and there was some question as to the wisdom of the plan. It has, however, proved so fundamentally sound and helpful that the same arrangement is continued in the present edition. The book is, however, shortened and its bulk reduced, by two changes, first, the abridgement of Part I which deals with methods of examination, and second, the reduction of the bibliography. The general principles and importance of the various methods of examination are presented in Part I, with particular emphasis on recent developments, but for details of history taking, physical examination, roentgenology, graphic recording, including electrocardiography, and other special methods of study the reader is referred to authoritative volumes dealing with these subjects at length. Their application to heart disease is illustrated in the appropriate chapters of this book concerned with particular kinds of heart disease. The bibliography is abbreviated, to include only the most important key references contained in the full bibliography of the first edition of 1931 with the addition of titles of a few selected publications that have appeared in the interval of the last five years. Rare key references that were inadvertently omitted from the first edition are included. With the smaller bibliography it has become convenient to place the references at the ends of the individual chapters. Parts II, III, and IV of the book concerned respectively with the incidence and etiologic types of heart disease, structural changes, and disorders of function remain unchanged except for the alteration or addition of subject matter in accord with the advances that have taken place in our knowledge of heart disease in the last five years. Many of the illustrations of the first edition have been replaced by new and better ones.

Finally, two new appendices have been added, the first giving chronologically the historical development of our knowledge of the anatomy, physiology, pathology, and medical aspects of the heart

and circulation, and the second giving the current classification of cardiac diagnosis approved by the American Heart Association. It is hoped that these will prove to be interesting and useful additions.

It is a pleasure again to acknowledge the cordial assistance of my colleagues and of my secretary, Agnes Donovan, in the preparation of the book, and of my wife in the correction of manuscript and proof. Invaluable aid has been given me by Wilbour C. Lown in the photographic preparation of many of the new illustrations, by Judson Niece in checking many of the new references in the bibliography and by Howard B. Sprague in correcting proof.

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## PREFACE TO THE FIRST EDITION

The need of a clear, concise, and comprehensive presentation of the diagnosis and treatment of heart disease in the light of our present knowledge has caused me to write this book. It is my hope that it will be of much service to students and practitioners of medicine, and that it will stimulate here and there an impelling curiosity to study further some of the obscure problems which are mentioned in almost every chapter. Concentrated effort to break a new path, or to widen one already begun, into the unknown boundaries of our knowledge will at least yield enjoyment, and may even afford the satisfaction of some new and useful discovery. The joy of the practice of medicine lies not only in service to others and in the intellectual pleasure of the work, but also in the realization that we are still but pioneers.

This is not a book concerned primarily with the details of anatomy, physiology, pathology, pharmacology, or instrumental technique, fundamental though such knowledge may be. The reader chiefly interested in these subjects or desiring special information about them is referred to authoritative works dealing more completely with them than is possible in a book of the present size and scope. Only such references to these subjects as are essential properly to discuss the diagnosis and treatment of heart disease will be included here. A few anatomical illustrations and physiological charts have been added for convenience.

Also, for the sake of simplicity and clearness, detailed references, controversies, and theoretical discussions have been largely omitted from the text, but an effort has been made to distinguish between facts and theories. At the end of the book some of the more notable or pertinent publications are listed, following by subjects the outline of the book and alphabetically arranged according to the authors. Reference to them is thus facilitated for the reader without distracting his attention from the text. This bibliographic index is intended to be as brief as is consistent with its usefulness; a perusal of many books published in the past shows how futile and unsatisfactory have been the attempts to collect complete bibliographies, except in the case of detailed works dealing with very special subjects. I would refer the reader to the *Index Medicus* and *Quarterly Cumulative Index* or to detailed bibliographies for full lists. It is possible that



some of the most notable references have been inadvertently omitted from the bibliography of this book; I would welcome notification of such omission.

Because of historical interest I have included in appropriate chapters brief quotations from the original works of some of the authors whose names have become famous through their connection with certain signs or symptoms or through the introduction of important methods of study. I hope that this will prove to be an interesting and stimulating feature.

The plan of the work has followed that adopted by myself and others in actual practice. There are four parts: the first deals with the examination of the patient and the analysis of his symptoms and signs; the second discusses the etiological types and causes of heart disease; the third deals with the structural changes present in the heart and great vessels; and the fourth takes up disorders of function. No longer in the diagnosis of heart disease can we be content to think of pathology alone, nor yet should we abandon these structural changes to consider function alone. According to our present knowledge and aspirations, we ought, in every patient with heart symptoms and signs, to think not only of these two diagnoses—structural and functional—but to add, as perhaps most important of all, a third, namely etiological. From my experience in cardiovascular disease, I feel convinced of the universal importance of this procedure. The arrangement of the book has, therefore, followed such a plan.

Treatment is not considered in a separate chapter since this would lead to much repetition. The treatment of each condition is included in the consideration of that condition. The subject index will facilitate reference to any particular drug or therapeutic measure about which information is desired.

The present work is concerned primarily only with diseases of the heart, an organ that must still be considered the most important structure in the maintenance of the circulation of blood in man. Such circulatory disorders as have a direct bearing on the function of the heart are included in the discussion; diseases of the arteries and veins in general are briefly considered, but not local extracardiac vascular disease like cerebral thrombosis. The title of the book has therefore been kept to the simple one of "Heart Disease" rather than made more extensive as "Cardiovascular Disease" or "Circulatory Disease."

In the accumulation of data on which this book is based, I acknowledge my indebtedness to a great many publications. To my teachers and associates I owe much and it is with great pleasure that I take this opportunity of expressing my gratitude. From Sir Thomas Lewis and Sir James Mackenzie I received great stimulation and

helpful training at the beginning of my special interest in cardiovascular disease. Drs. David L. Edsall and William H. Smith not only made it possible for me to meet these masters in the field, but they, together with other teachers in medical school and hospital, gave me instruction in the fundamentals of the diagnosis and treatment of heart disease. Drs. Richard C. Cabot, Henry Jackson, Roger I. Lee, and Joseph H. Pratt have been especially instrumental in stimulating my interest in the subject. My associates in study and investigation in Boston and in the Massachusetts General Hospital have also been a great help and inspiration. Furthermore I wish to thank Dr. James Howard Means for making possible the continuation of my concentration in the study of heart disease, and Dr. Howard B. Sprague for aid in the work itself.

I would especially acknowledge my indebtedness to the many patients with heart symptoms and signs who have made it possible for me during the past fifteen years to acquire personal experience and knowledge without which I should never have attempted to write this book. One third of these patients have been seen by me in private practice (about 4,000 cases) and, through their coöperation and intelligence, have been the most important source of my knowledge of heart disease. To them I express my gratitude as well as to the physicians who have referred them to me in consultation.

A recent visit abroad has allowed me to learn a little of the present viewpoints of various European schools in the diagnosis and treatment of heart disease, and I am grateful to the physicians of these countries who so cordially assisted me in obtaining this information. I have tried to incorporate in this book the most important truths, whether they have been gained from my own experience in actual practice or from the work or publications of others, in my own environment or school, in other American communities, or in other countries.

I am indebted to Dr. Sprague for his revision of the manuscript and proof of this book, to Dr. Hugo Rösler of Vienna for many of the orthodiagrams, and to Dr. George W. Holmes of Boston for the roentgenogram illustrating the chapter on roentgenology. Dr. Ronald T. Grant of London has kindly let me use some of his photographs illustrating pathological conditions. I wish to thank also several authors and publishers for their cordial permission to reproduce certain figures, and the Graphic Arts Engraving Company of Boston and Mr. Philip Nutting of the Massachusetts General Hospital who have rendered me invaluable aid in the preparation of new drawings and photographs.

Finally, and of vital importance in the preparation of this book, have been the constant help of my wife, particularly in verifying the bibliography, the aid of Dr. James W. Esler of Washington who

traced for us at the Surgeon General's Library some of the more inaccessible references, the advice and suggestions of my father, the copying of the manuscript and correction of the proof by my secretary, Miss Agnes Donovan, and the coöperation of the publishers, The Macmillan Company.

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