



FOURTH EDITION

# • *Office* ENDOCRINOLOGY

By

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*With a FOREWORD by*

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ENDOCRINOLOGY



#### HUMAN OVULATION

An apparently healthy ovum about to be washed out from the partially collapsed follicle in the process of ovulation. Note the dehiscence of the capsular part of the ovary or the rupture point; note the ovum still situated in a recognizable cumulus. (From: Greenblatt, R. B., *Am. J. Obst. & Gynec.* 42: 983, 1941.)

DEDICATED

TO

GWENITH

### A PROPHECY

“ . . . the new and special subject of Endocrinology . . . is sweeping aside many long-cherished views of disease in a tidal wave as momentous as that which swept over medicine at the end of the last century upon the discovery of the bacterial origin of the infectious disorders.”

HARVEY CUSHING

Lister Memorial Lecture, 1930

## PREFACE TO FOURTH EDITION

**F**IVE YEARS have elapsed since the publication of the Third Edition. The reception accorded that edition was indeed gratifying. The question of reprintings was considered but abandoned because it was felt that so much had transpired, so much progress had been made in the last few years that a new edition was warranted. The fourth edition was prepared with the general practitioner in mind and not the man primarily working in the field of endocrinology. The book has been, to a large extent, rewritten. Several chapters have been deleted, many have been altered considerably and some 20 new chapters have been added.

I have written only of what I know: of those aspects of Endocrinology and related fields with which I have had personal experience. The various subjects discussed, the endocrine and pharmacologic preparations recommended, the diagnostic tests outlined, the office procedures described—all have been tried, used and evaluated in my office work, clinic and laboratory. The subject matter was approached from a clinical rather than an experimental point of view. The characterization and treatment of clinical endocrinopathies have been emphasized.

The aid of past and present fellows in my department is acknowledged. I appreciate the clinical assistance rendered by Doctors William E. Barfield, Roland Suran, and Jule C. Neal; the performance of tedious hormonal assays and laboratory procedures by Sarah Clark, Robert West and Nelson H. Brown; the preparation of many of the cytological smears used in Chapter 53, by Dr. Herbert Nieburgs. My secretary, Miss Cecelia O'Connor, is deserving of special thanks for her untiring efforts in preparing this manuscript.

To Doctors G. Lombard Kelly, Edgar R. Pund, V. P. Sydenstricker, Richard Torpin, Hervey Cleckley, A. P. Briggs, Jack Sherman, L. P. Holmes, Lester Bowles, J. R. Rinker, H. B. O'Rear and Peter Wright and to other faculty heads at the Medical College of Georgia who have cooperated in one way or another,



I extend my appreciation. Credit for many of the excellent illustrations and photographs is due Mr. Orville A. Parks and his associates, Miss Mary Hallinan and Mr. Jack Wood of the Department of Medical Illustration.

Much of the new material in this edition has appeared as articles or chapters prepared by the author for other publications. I am indebted to *Medical and Surgical Clinics of North America*, *American Journal of Obstetrics and Gynecology*, *Journal of Clinical Endocrinology*, *Post-Graduate Medicine*, *Merck Manual*, *Ciba Symposia*, *Ros' Manual of Therapeutics* (Cuba) and *Fertility and Sterility*, for the opportunity of incorporating some of this material into this edition. Lastly, I am grateful to Dr. Warren Nelson for the chapter on Testicular Biopsy and constructive suggestions for the section on Male Endocrinology.

ROBERT B. GREENBLATT

Augusta, Georgia

## PREFACE TO THIRD EDITION

OFFICE ENDOCRINOLOGY attempts to deal not only with many of the endocrine problems that arise in everyday practice, but also with non-endocrine conditions which frequently simulate or are confused with endocrinopathies. This edition was written, as were the previous ones, for the *practising physician* with the usual office equipment and with the laboratory facilities afforded by the average community hospital. I have not forgotten that complicated hormonal determinations for the present remain beyond the realm of most hospital laboratories; and that consultations in endocrinology are not always available, particularly in smaller communities.

Fundamental biological considerations have been discussed at a length no greater than necessary to provide the clinician with a sound background for diagnosis and therapy. As regards therapy, I have recommended medication only in such doses as are calculated to do as much good as possible without harmful side-effects. This, it seems to me, is the only safe course to steer in a branch of medicine in which many causes and effects are still left unexplained. In recent years, it has become fashionable to be derisive of hormonal measures. But fortunately we have here "a custom more honor'd in the breach than in the observance"; and it has been noted that those nihilists who often proscribe hormonal therapy on the rostrum sometimes prescribe it in private practice.

In these pages, I have codified, without attempt at encyclopedic documentation, the experiences gained in the clinic, in the laboratory, and from other investigators. The facts, so gathered, have been interpreted so as to be of value to clinician and student alike.

The first edition was conceived as a primer. The second edition with revisions and enlargements was soon followed by a re-printing. With the appearance of the third edition, it is hoped that the original *booklet*, now past its growing pains, has here "come of age."

An expression of appreciation is due to Mr. Charles C Thomas and Mr. Payne Thomas for many thoughtful courtesies; to Dr. George Corner of the Carnegie Institution for his generosity in providing several illustrations; to the editors of the *Journal of Clinical Endocrinology* for the liberty to incorporate several editorials written by the author; and to Admiral Carl Michel, Commandant-Medical, U. S. Coast Guard, for permission to complete the revision of this book while on sea duty.

ROBERT B. GREENBLATT

Augusta, Georgia

## PREFACE TO SECOND EDITION

THE gratifying reception accorded the first edition of *Office Endocrinology* indicates that there is a need for such a manual. Endocrinology is a relatively new field and for that reason the modus operandi of many hormonal preparations or the reason for their indications remain controversial. The busy practitioner cannot keep up with rapid advances in the field nor is he interested in the polemics of *why* and *wherefore*. The clinician prefers to follow the crystallized experience of some particular investigator when set down simply and definitely. The entire book has been revised and several new chapters have been added to this second edition and, in answer to many requests, a small section concerning some of the more common endocrine problems in the male has been included.

It is my pleasure to express my gratitude to Frank Mortara, M.D., and Quinby Hair, B.S., for their coöperation in the clinic and sex-endocrine laboratory respectively and to Herbert Kuperman, Ph.D., for his aid in biologic assays, animal experimentation and his critical appraisal of many problems. To Miss Cecelia O'Connor, I owe much for her unselfish devotion to the task of preparing the manuscript.

ROBERT B. GREENBLATT

Augusta, Georgia

## PREFACE TO FIRST EDITION

THIS booklet is not intended as a textbook. It is in answer to the suggestion of former students and particularly the attendants of my postgraduate classes and clinics to put into print as a refresher and guide those aspects of endocrinology which have practical and clinical application. Though much is lacking in these pages, no apology is made for brevity and simplicity. What has been written is based on histologic and physiologic studies as well as my personal experiences, presented in a direct manner to those who are not working primarily in this field. Regular textbooks in endocrinology are recommended for a more comprehensive study. The booklet is a collection of my lectures as delivered to a postgraduate class in Office Endocrinology, prepared in abbreviated form with much of the theoretical and experimental data purposely deleted.

I am indebted to Miss Hildegard Lewis who carefully abstracted certain of my publications, which, along with her notes of my lectures, formed the basis for this undertaking. Her invaluable assistance with the revision and editing of the manuscript is gratefully acknowledged.

I wish to express my appreciation to E. R. Pund, R. Torpin, E. A. Wilcox, J. Krafka and W. R. Brown for direct assistance in many of my research problems. My associations and discussions with V. P. Sydenstricker, H. M. Cleckley, R. H. Chaney and J. W. Brittingham have been stimulating and enlightening. To Walter Schiller I owe my conceptions of ovarian embryology. My thanks are due Dean G. Lombard Kelly for sharing his understanding of many endocrine problems, and for his encouragement and aid in establishing a sex-endocrine laboratory.

ROBERT B. GREENBLATT

Augusta, Georgia

## FOREWORD TO FIRST EDITION

IT HAS been stated that there have been three epochs in the accumulation of our knowledge concerning the ductless glands and their hormones. The first lasted from ancient times until the middle of the 19th century and, during this time, mere speculation prevailed. The second epoch was during the latter half of the 19th century and was experimental, consisting of the observation of withdrawal effects. The third, and by far the most important, has lasted through the four decades of the present century. This is the biochemical epoch, characterized by analysis, synthesis and the study of replacement effects.

Many do not realize that it has been nearly fifty years since the discovery of pituitrin. Adrenalin was added in 1901, thyroxin in 1914, insulin in 1921, growth hormone of the hypophysis in 1921, folliculin in 1923, parathormone in 1924, cortin in 1927, pitocin and pitressin in 1928, progestin in 1928, sex hormones of the anterior hypophysis in 1928, theelin in 1929, theelol in 1930, emmenin in 1930, eschatin in 1930 and more recently, of course, many other hormones, with the list, like that of the vitamins, constantly growing.

While the use of the products of the glands of internal secretions has been of signal benefit in many fields of medicine, in no branch of medicine has the progress been more rapid or more salutary than in the field of gynecology. Fortunately the clinical investigators, such as the author of this book, have kept pace with the biochemists and physiologists and the average clinician may now avail himself of the wonderful new discoveries as they apply to the patients in their keeping.

In the light of what has gone before, we can only ask: "What will the next fifty years add to our present knowledge?" And we can look back fifty years and get more than an intimation of the answer.

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Dean, University of Georgia  
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