AND PATHOLOGY

SEVENTH EDITION

With 316 Illustrations

SEVENTH EDITION

Printed in the United States of America

Library of Congress Catalog Card Number 60-5615
Distributed in Great Britain by Henry Kimpton, London

Table of Contents

Part Two Pathology

Carter's

MICROBIOLOGY AND PATHOLOGY

ALICE LORRAINE SMITH, A.B., M.D.

Pathologist, J. K. and Susie L. Wadley Research Institute and Blood Bank, Dallas, Texas
Professor of Pathology, Graduate Research Institute of Baylor University, Dallas, Texas
Associate Professor of Pathology, Baylor University College of Dentistry, Dallas, Texas
Clinical Associate Professor of Pathology, The University of Texas Southwestern Medical School, Dallas, Texas
Assistant Professor of Microbiology, Department of Nursing, Sacred Heart Dominican College and St. Joseph's Hospital, Houston, Texas
Formerly Instructor in Microbiology and Pathology,
Parkland Hospital School of Nursing, Dallas. Texas

Carter's
MICROBIOLOGY

AND PATHOLOGY

SEVENTH EDITION

With 316 Illustrations

SEVENTH EDITION

Library of Congress Catalog Card Number 60-5615
Distributed in Great Britain by Henry Kimpton, London

Preface to Seventh Edition

It is with heaviness of heart that I have undertaken alone this, the seventh, edition of *Microbiology and Pathology*, for in the passing of Dr. Charles Franklin Carter since publication of the last edition there is a deep sense of both personal and professional loss.

This edition is presented for the purpose of including information in rapidly expanding scientific areas which is becoming available today. The content of the book has been carefully checked, and much of the material has been rewritten and rearranged. A general survey of the principles of microbiology is preserved, with basic descriptions of the most important disease-producing microbes including discussions of the reactions of living cells and tissues to contact with such microorganisms. Special emphasis is given to certain practical applications of the science of microbiology in medicine, nursing, public health, and industry.

One complete unit is devoted to the physical and chemical control of microbes. The unit on General Principles of Microbiology has been revised with the full realization that this subject is swiftly progressive in these days of the electron microscope, Salk vaccine, and even the ultrasonic dishwasher. The author feels it important that the student be informed of the current thinking in the special subdivisions of the broad field of microbiology—notably virology, immunology, allergy, and practical antisepsis. Careful revision of terminology of the various kinds of microorganisms has been made in keeping with the most recent edition of *Bergey's Manual of Determinative Bacteriology* and with certain other accepted authorities.

The organization of Part II, Pathology, has been changed considerably. It is divided into two units—General Principles of Pathology and Special Pathology of the Major Organ Systems. The unit on General Principles of Pathology emphasizes, for teaching purposes, the major etiological categories of disease. In keeping with this approach a new chapter is included on Injuries From Nonliving Agents. In this chapter an outline of poisons is given, the student is introduced to radioisotopes and certain uses of nuclear medicine, and pathological concepts of radiation and atomic bomb injury are briefly discussed. Practical pathology is the study of disease through the study of changes in both tissues and body fluids and elimination products. In the unit on Special Pathology of the Major Organ Systems, an effort has been made to correlate wherever possible the anatomi-

cal (tissue and cellular) changes with the changes in composition of body fluids which are measurable by modern laboratory technics.

In all parts of the book the illustrations have been re-examined and, where necessary, reworked so as to most effectively supplement the prose of the text. At times facts are arranged in chart or tabular form to convey a more concise picture to the student. Because of the many modern advances made in scientific laboratory equipment, the student is introduced to certain important practical applications of such equipment in widespread use in hospitals and scientific laboratories.

The suggestions and criticisms which have been useful in preparing this edition were gratefully received. The author's aim is always to present practical and useful information in its most appealing form. To the many teachers who have used previous editions to such an extent that this, the seventh edition, seems timely, a debt of gratitude which can never be repaid is acknowledged.

Alice Lorraine Smith

Preface to Sixth Edition

Twenty-eight years ago the small volume from which this book grew came from the press of The C. V. Mosby Company. The first edition of the book in its present form and bearing its present title was published eight years later. This period, a little more than a quarter of a century, has been a time of unprecedented development of the science and art of medicine and of momentous change in mankind's method of living. During the early part of this period the prevention and treatment of infectious diseases by vaccines and serum therapy reached a high state of development and the production of an active or passive immunity was the result desired in both the control and treatment of these diseases. During this time the sulfonamide

gs and antibiotics were not known. Later the sulfonamide drugs to a great extent replaced the therapeutic serums in the treatment of disease, but not the vaccines in the prevention of disease, and then to a considerable extent were themselves replaced by the antibiotics. With these changes went other changes that influenced the teaching of microbiology and pathology. Certain diseases such as typhoid fever and malaria, which were once very prevalent, became uncommon, and diseases such as homologous serum jaundice and the Coxsackie virus diseases, which had not been recognized before, were observed. Other changes which have influenced research and modified the teaching of pathology are the alarming increase in the incidence of cancer, now one of the leading causes of death, a more extensive study of heart disease, the most common cause of death, and the development of new ideas about other diseases already well known.

This edition, like its predecessors, is written primarily for the purpose of including information which has become available during the life of the previous edition and the omission of ideas that have become obsolete. Much of the material has been rewritten, and some of it has been rearranged. Numerous new illustrations have been added and some have been replaced. The chapter arrangement remains to a great extent the same as in previous editions. Subjects, such as agammaglobulinemia, C-reactive protein, Salk vaccine, cat-scratch fever, the two types of rat-bite fever, the chemotherapy of viral diseases, and the precautions to be taken in vaccine and serum therapy are discussed for the first time. Other subjects are discussed more completely. This is particularly true in the chapters on the chemical inhibition and destruction of