

BLOOM  
—  
FAWCETT

A TEXTBOOK OF HISTOLOGY

Eighth Edition

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A TEXTBOOK OF **HISTOLOGY**

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At the time of his death in 1928, Alexander A. Maximow left an unfinished manuscript of a Textbook of Histology. This was completed and edited by William Bloom with the help of some of his colleagues, especially the late C. Judson Herrick.

Extensively revised editions appeared in 1934, 1938, 1942, 1948, 1952, and 1957. There have been four Spanish editions, one Portuguese, and one Korean.

All of the editions profited by criticisms and contributions of material by many histologists. With the passing years, most of the original work and early changes have been modified or eliminated in successive revisions as points of view changed and new discoveries were made. However, unchanged are some parts of the material contributed by Professor George W. Bartelmez on the female reproductive system, by Professors C. Judson Herrick and Stephen Polyak on nerve, by Professor Isidore Gersh on exocrine and endocrine glands, and by Professor Clayton G. Loosli on the lung.

In the eighth edition, presented herewith, Professor Don W. Fawcett has joined William Bloom as coauthor of the book and sharer of the work.

# PREFACE TO THE EIGHTH EDITION

WITH THE CHANGE in authorship which marks this new edition, it seems fitting to repeat that the aim of this book is to provide students of biology, and especially medical students, with a text on histology and histophysiology which also endeavors to acquaint them with some of the revolutionary changes taking place in biology and medicine as a result of the fusion of microscopic and sub-microscopic histology, physiology, biochemistry, biophysics, and the burgeoning science of molecular biology. The observational content and concepts encompassed in these fields are of fundamental importance to the understanding of all living things, ranging from simple organisms to man.

Even a cursory survey of current journals shows the rewarding investment of time and energy being devoted to electron microscopy and other powerful new methods of morphological investigation. Indispensable among these latter are autoradiography, immunohistological methods, improved polarization microscopy, x-ray diffraction, and other modern physical and biochemical methods for the analysis of the structure of complex biological materials, such as collagen, myoglobin, hemoglobin, and nucleic acids. Exploitation of these techniques has already yielded an ample harvest of important discoveries. A dramatic example of the effect of such advances is the change of emphasis in the study of nucleic acids since this book was begun 35 years ago. At that time interest was focused on their chemical nature; the possibility of their genetic importance seems to have been considered only rarely, if at all. Today, the study of the role of these compounds in heredity and in the control of the synthetic activities of cells represents one of the great adventures in biological exploration. The recent, apparently explicit, chemical solution of the genetic code, relating the sequence of amino acids in proteins to the sequence of nucleotides in DNA, has engendered new confidence that further considerable progress toward elucidating the mechanisms controlling normal and abnormal development can be expected.

Significant changes have been made in many parts of the book. Chapter 1, which was thoroughly rewritten, contains enlarged discussions of cytoplasmic and nuclear constituents and of mitosis. This chapter was also expanded to include a consideration by Professor E. Peter Geiduschek of biologically signifi-

cant macromolecules—proteins, lipids, and various types of nucleic acids, and a section by Professor Robert B. Uretz on principles underlying the use of optical methods in the investigation of cellular structure. To illustrate this chapter, we found it necessary to add 28 electron micrographs (a few as replacements), 3 photomicrographs, and 2 drawings.

We feel strongly that it is desirable to provide enough in text and illustration of both light and electron microscopy to help the student gain some idea of the path now being trod toward an understanding of the molecular basis of the structure of cells and their products. It is for this reason that we were at some pains in the first chapter to stress the importance to the student of realizing how great is the magnification attained by the electron microscope.

Extensively rewritten are parts of the chapters on muscle, glands, hypophysis, adrenal, epithelium, stomach, pancreas, and the male generative system. Important changes were also made in the chapters on nerve, teeth, connective tissue, thymus, pineal, skin, and kidney.

The description of the liver was completely recast from morphological and functional points of view by Professor J. Walter Wilson. Professor Robert H. Haynes revised the discussion of the histophysiology of the retina. Professor Matthew Block gave much critical assistance and added important new material to the descriptions of blood and the myeloid tissue.

Professors F. C. McLean and Ann Budy are responsible for most of the revision of the material on bone mineral, remodeling of bone, and the action of the parathyroid hormone. Professor W. H. Taliaferro improved the section on splenic functions; Professor E. A. Boyden added to his description of the extra-hepatic biliary passages, and Professor Henry Kaplan edited his discussion of the thymus and of leukemia. We have also incorporated valuable suggestions from Professors W. L. Doyle, E. Goldwasser, A. V. Nalbandov, Ruth Rhines, Isaac Schour, and E. W. Taylor.

The rapid technical improvements in electron microscopy made it necessary to replace 35 electron micrographs; a similar fate undoubtedly awaits some of the new ones we have just added to the book. There are 112 new electron micrographs, 22 new photomicrographs, and 8 new diagrams or drawings. Many of the new figures were generously contributed by others; these sources are acknowledged in the legends. Ten of the old drawings have been redrawn for greater clarity in reproduction by Mrs. E. Bohlman Patterson.

We gratefully acknowledge the helpful criticisms and suggestions which have come to us in great numbers. They have added to the accuracy, lucidity, and scope of the book. We hope we will continue to be so favored in the years to come.

WILLIAM BLOOM  
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