

SCHEIE AND ALBERT

Textbook of
Ophthalmology

Textbook of Ophthalmology

Ninth Edition

With 565 illustrations and 38 color plates

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Dr. Sanford R. Gifford, whose first edition of this *Textbook of Ophthalmology* was published in 1938, sought to provide a volume that would be useful to the medical student and the general physician. His success in doing so can be gauged to a degree by the fact that 39 years and many medical school curricula changes later the book is going into its ninth edition. The third edition (1945) was the last to be authored by Dr. Gifford prior to his untimely death in 1944.

Dr. Francis Heed Adler wisely saw the need for an ophthalmology textbook that continued Dr. Gifford's original purpose. Consequently, editions four, five, and six (1947, 1953, 1957) were published as Gifford's *Textbook of Ophthalmology*, although with each edition the contents were considerably expanded, rewritten, and revised. By the time of the seventh edition (1962), the revision and rewriting were sufficiently extensive to warrant publishing under the title of a *Textbook of Ophthalmology*, by Francis Heed Adler.

That edition was but a few years off the press before it was readily apparent that the tremendous explosion of knowledge and the revolution in curricula already in evidence mandated a radically new volume. Accordingly, Dr. Scheie, who had succeeded Dr. Adler as chairman of the Department of Ophthalmology, invited Dr. Daniel M. Albert to join him as co-author of the eighth edition (1969) under the title *Adler's Textbook of Ophthalmology*. In addition, several staff members of the Department of Ophthalmology were asked to collaborate in the preparation of chapters on subject matter of particular interest to them and to which they have devoted considerable study. And now the ninth edition reflects, as the Preface states, expansion and refinement over the eighth edition which the authors and contributing authors consider significant and relevant to the understanding and practice of ophthalmology today.

*Dedicated to
our wives and children*

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Preface to the Ninth Edition

The editors and contributors to this ninth edition of *Textbook of Ophthalmology* are strongly aware of the responsibilities and opportunities that this new volume presents. Accordingly, our goal has been to incorporate the pertinent advances in ophthalmology of the last six years into a readable, accurate, concise, and well-illustrated text. Refinement in organization over that of the eighth edition is reflected by the more strict arrangement of the contents into sections dealing with the basic science aspects of ophthalmology, techniques of examination, and clinical aspects of ophthalmology. With this arrangement the book should be more useful to the medical student and ophthalmology resident and will more conveniently meet the specific needs of the established ophthalmologist, general practitioner, internist, or neurologist. Among the new features are chapters on fundus fluorescein angiography, ophthalmic ultrasonography, and x-ray of the orbit. These techniques have become well established in the basic practice of ophthalmology, and a knowledge of them is necessary for those concerned with eye diseases.

This expansion of the present edition continues the pattern that has been followed since Gifford's relatively brief volume was first published in 1938. As new knowledge is gained and new techniques are widely adapted, their inclusion in a basic ophthalmology text is warranted. Also, a more detailed and better illustrated fundamental textbook, as well as a revised format, is essential to help compensate for the decreased time provided for didactic lectures and exposure to patients with eye diseases brought about by the comparatively recent revolution in medical school curriculum.

How comprehensive a text of this sort should be, however, posed an extremely difficult problem. The publisher's queries to outside authorities drew responses reflecting diverse points of view. Some ophthalmologists concerned with the training of medical students suggested that a less detailed, smaller text would be better suited for students' needs; other teachers and clinicians desired a more inclusive work, even expanded to two volumes. The editors and the authors of the various chapters have each relied upon their own judgment as well as the advice of experienced educators and clinicians in selecting topics and the degree of detail that they considered significant and relevant. Admittedly, this reflects personal prejudices and will not please everyone, but we have done our best.

In this preface, one aspect of ophthalmology that we would like to touch

upon for the medical student and intern are the special challenges and rewards which ophthalmology offers. Students of the history of medicine in the United States are aware of the birth pangs and growing pains which the medical and surgical specialties have experienced—even into the present century. Only reluctantly did the general practitioner and the general surgeon relinquish facets of the practice of medicine to those who had spent additional years of training acquiring special skills and knowledge in such fields as the treatment of eye diseases. Even today the student intent on a career in ophthalmology is sometimes counseled that he is retreating to a rarefied and remote medical specialty, supposedly to lay aside his stethoscope forever and drastically limit his medical horizons.

In recent decades great progress in the world of medicine has led to an increasing need for a multiplicity of special skills to successfully diagnose and treat disease. The information crisis has also affected medicine and resulted in a need for heightened communication and learning through meetings and journals and other publications. No longer can the general practitioner or general surgeon claim expertise in all areas of medical practice. Even in the specialties there is a tendency toward subspecialization because of the growth of our knowledge. Ophthalmology, however, has emerged as one of the broadest and most exciting careers in medicine. For example, it is becoming apparent that an ever-increasing number of systemic diseases have ocular signs and symptoms. The endocrinologist, immunologist, infectious disease specialist, cardiovascular specialist, and other medical specialists look to the ophthalmologist for help and guidance in diagnosing diseases. Far from being isolated, the ophthalmologist has assumed a central role in the diagnosis and monitoring of a large portion of human disease.

In diseases affecting primarily the eye, a most attractive feature of ophthalmology is the opportunity for the ophthalmologist to treat patients at all ages and stages of life: the infant with congenital glaucoma or strabismus, the child with hyphema or a refractive problem, the juvenile diabetic, the presbyope, cataract patients (young and old), and the elderly with retinal degeneration. Nor does an artificial division exist, as it does in most other specialties, between the medical and surgical care of the patient. Indeed, the very nature of eye disease establishes a deep and gratifying doctor-patient relationship between the ophthalmologist and those under his care. The patient looks to the ophthalmologist for more than prescriptions and procedures. He expects the guidance, the concern, the understanding, and the direction that are the essence of the practice of medicine.

It must be borne in mind, however, that ophthalmology has extreme demands and responsibilities. Notably, there is little room for error. Surgery, as well as medical diagnosis and treatment, must be done right the first time, for second chances may not come. The practitioner of ophthalmology must be well read, up to date in surgical and diagnostic techniques, not given to “cutting corners” or procrastinating, and his work at all times must be meticulous and complete. The penalty for a mistake may well be a blind eye.

To those in the practice of medicine, we hope the facts contained in this book will serve them well. To those faced with the decision of what field of medicine to enter, we hope that this book will give some insight into the nature of this most fascinating and rewarding of medical specialties.

HAROLD G. SCHEIE
DANIEL M. ALBERT

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I Introduction to Ophthalmology

Ophthalmic Overview: An Introduction to Ophthalmic Diseases and Their Terminology

PURPOSE

This textbook approaches the study of the eye and its diseases from the standpoint of basic sciences and broad medical disciplines as well as in terms of certain disorders and modes of treatment unique to ophthalmology. To provide orientation and perspective this first chapter presents a brief survey of the disease entities of the eye. In the organization and discussion of these abnormalities in later chapters it will be seen that the manner in which each structure of the eye can respond to inflammation, infection, or other forms of disease is limited. Many ocular changes

which are similar are seen as resulting from causes which are different. Accordingly, certain patterns of response are discussed more than once within their respective contexts, which consequently necessitates repetition of ophthalmic terminology. Cross-referencing points out these common processes.

Another aim of this initial chapter is to provide an introduction to ophthalmic terminology which is largely derived from the anatomy of the eye. Figures 1-1 to 1-9 orient the reader to the anatomy of the eye and assist him in understanding ophthalmic terminology. Detailed discussion of the anatomy follows in Chapter 2.