

**TEXT-BOOK OF  
OPHTHALMOSCOP  
Y. PART I**

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Text-book of ophthalmoscopy. Part I by Edward G. Loring

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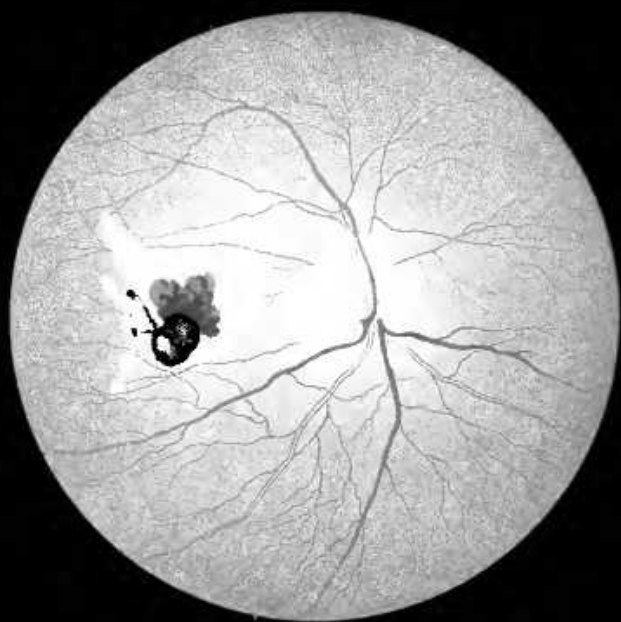
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**EDWARD G. LORING**

**TEXT-BOOK OF  
OPHTHALMOSCOP  
Y. PART I**





*J. H. Woodward*  
1884  
TEXT-BOOK

OF

OPHTHALMOSCOPY.

BY

EDWARD G. LORING, M. D.

PART I.

THE NORMAL EYE, DETERMINATION OF REFRACTION,  
DISEASES OF THE MEDIA, PHYSIOLOGICAL OPTICS,  
AND THEORY OF THE OPHTHALMOSCOPE.

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# TEXT-BOOK OF OPHTHALMOSCOPY.

## CHAPTER I.

### *REMARKS ON THE OPHTHALMOSCOPE.*

IN the whole history of medicine there is no more beautiful episode than the invention of the ophthalmoscope, and physiology has few greater triumphs. With it it is like walking into Nature's laboratory and "seeing the Infinite in action," since by its means we are enabled to look upon the only nerve in the whole body which can ever lie open to our inspection under physiological conditions, and to follow in a transparent membrane an isolated circulation from its entrance into the eye through the arteries to its exit in the veins. We are further enabled to watch and study daily, or even hourly, morbid processes in each and every phase, from simple hyperemia to absolute stasis, and from passive cedema to the most violent inflammation; while oftentimes through its agency also we get the first intimation of disease in remote and seemingly unconnected organs, so as to read, as if in a book, "the written troubles of the brain," the heart, the spleen, the kidneys, and the spine.

It is little wonder, then, that the adept learns to look upon the ophthalmoscope as one of the most beautiful in theory, the most perfect in practice, and the most far-reaching in results, of any of the instruments known to medical science, or that he should be brought to consider the invention of Helmholtz as the most potent factor in bringing the art of ophthalmology to the highest plane of medical diagnosis and treatment.\* Nor is it surprising that even the student, once entered upon its investigation, finds the study of the instrument as fascinating as it can be made profound. It is to enable him to prosecute such studies with greater ease and with more expedition than if left to himself, that the following pages are written.

\* Virchow, "Trans. Internat. Congress," London, 1881.

That the ophthalmoscope has become a necessity in the detection of disease is now universally admitted. Physicians, therefore, at the present time are much more interested in the facts which the mirror reveals than in the principles upon which it depends. To understand, however, the practical working of the instrument and the full extent of its application, the few fundamental laws upon which it depends must be thoroughly understood. For such as are not already acquainted with them, these laws, briefly and simply stated, will be found in the Appendix at the end of the volume.

In making an ophthalmoscopic examination three principal things are to be considered :

1. The instrument and the illumination used.
2. The optical condition of the observer's eye.
3. The optical and physical condition of the eye to be observed.

The great aim in an ophthalmoscope should be largeness of field of view, with suitable and sufficient illumination. These requirements seem to be fulfilled best in the general shape and construction of what is known as Liebreich's small ophthalmoscope, which consists of the concave mirror with a central aperture attached to a short, straight handle. The mirror is usually about seven inches focal length, with a clip at the back for the necessary correcting-glasses. Unfortunately, these instruments as made abroad, though cheap, are comparatively worthless, from the mirrors not being true, and from the annoying reflections arising from the edges of the perforation and back-plate of the mirror. For lightness, freedom from reflections, and durability, there are no superior instruments to those now made in New York, notably by Messrs. Hunter and Meyrowitz, whose instruments in the way of workmanship and optical accuracy are unsurpassed. Almost every ophthalmologist has taken a hand in perfecting or at least altering the instrument, and from the first I have, perhaps, done more than my share. To mention all the modifications now known and in use would make a book of itself, and I must refer those who are curious as to the evolution of this beautiful instrument to the current literature of the day. My advice to the student is in the beginning to get the best instrument of its kind, not necessarily the most complex and the highest priced, assuring him that it makes no difference whatever whose instrument he uses, provided it is comprehensive enough to suit his wants, and that he learns how to use it with judgment and skill. Beginning with the simpler ones, he can pass to those which are more complex, should occasion require. In the Appendix will be found a description of some of the forms sug-