

THE PHOROPTOR

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The Phoroptor by Henry L. De Zeng

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HENRY L. DE ZENG

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By *e*
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"THE MODERN PHOROMETER"

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PREFACE

HISTORY is replete with illustrations of the fact that progress in scientific knowledge and the development of improved apparatus go hand in hand, each being to a great extent dependent upon the other. It is therefore not surprising that the constantly increasing realization of the important rôle played by the motor muscles of the eye in affecting both our vision and health, has been accompanied by marked development in ophthalmologic instruments for making more thorough muscle tests.

If this book contributes in any degree to a clearer understanding of the importance of testing the ocular muscles and of the possibilities of great good to be accomplished through the systematic making of such tests, the object of the work will have been attained.

CHAPTER I

The Evolution of Eye Testing

ALTHOUGH spectacles were invented over six hundred years ago by the Italian d'Armati and have since been worn extensively by every civilized nation, little or no development worthy of mention took place either in the general construction or the method of application of spectacles until the discovery of astigmatism, by Thomas Young, during the early part of the previous generation.

It is well within the recollection of the writer when it was the custom to purchase spectacles much after the fashion of shoes, from retail stores, by trying them on and taking the pair which seemed to fit the best; no eye examinations of any sort then being made or considered necessary. However, with the discovery of astigmatism and the advent of the cylindrical lens for its correction, the importance of eye examinations became at once apparent and the necessity of examining each eye separately was also recognized. Today no one desiring a correct pair of glasses thinks of purchas-

ing them in the old way, but consults one trained in the art, who is prepared to systematically test each eye separately and finally both eyes together, and prescribe lenses to meet all requirements, taking into account any imbalances of the motor muscles as well as errors of refraction which may be present.

It has long been recognized that the muscles which move the eyes in their orbits, known as the extrinsic or motor muscles, should be so interrelated or naturally balanced, that the visual axis of one eye will intersect that of the other eye at the point of fixation and the images of the object observed will form on exactly corresponding points in the retinas of the two eyes. In the absence of such natural muscular balance, binocular single vision could only be maintained through constant effort by the weaker muscles; otherwise the stronger and opposing muscle of any pair would rotate the eye toward itself and in so doing prevent intersection of the visual lines at the point of fixation and simultaneously the formation of the images at corresponding points in the two retinas.

As the fundamental law governing binocular single vision is based upon the physiologic