SECOND EDITION

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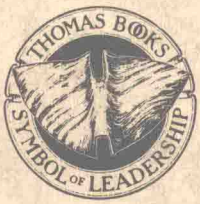
Fourth Printing

OPHTHALMIC DISPENSING

RUSSELL L. STIMSON

Los Angeles, California

This Second Edition is intended to serve as a primary reference and study during the apprenticeship of prescription opticians as well as a college text book, and has been extended to serve as a complete home-study course. Much of the information necessary to prepare the reader for the American Board of Opticianry examinations is provided here, and offers to students and practicing dispensers an exposition of all matters relating to the dispensing of ophthalmic lenses.



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To
My Wife

PREFACE TO THE FIRST EDITION

The selection and adjustment of the proper lenses and frames for a prospective wearer of spectacles has become a matter of interest that is not confined to the artisans who prepare them. Therefore this book for practicing opticians is not intended for their use exclusively. To the end that it might be more interesting and instructive to students in courses in ophthalmic optics in the technical schools, optometry schools, or graduate courses in ophthalmology, the introductory chapters have been somewhat amplified. It is hoped that by its arrangement it may be helpful to nurses and technical assistants in refractionists' offices. Remarkable advances in the science of refraction and lens technology in the past decade demand more than a superficial knowledge of opticianry to apply lenses and frames to new problems and new needs. Although ophthalmic lenses are first discussed as a separate physical entity, throughout the remainder of the book they are considered as a component of an optical system in which the ametropic eyes and the patient himself are parts. Hitherto the literature does not seem to contain a unified treatment of lens and frame fitting. It is my hope that it is accomplished in this publication.

So far as is possible the subject has been treated in simple language. A glossary is appended for the assistance of those to whom the material is new. Numerous illustrations are spread throughout the text in which an effort has been made to simply portray the subject matter. References to the literature placed at the bottom of the page on which the subject is discussed are for the use of those who wish to pursue specialized phases more intensively.

During the preparation of this book I have had the unsparing assistance from a number of individuals. Those whom I wish especially to mention are Mr. Ralph Barstow, who originally urged me to set down my notions on paper; Dr. Charles Sheard

of the Mayo Clinic, for counsel on the arrangement of the subject matter; Dr. William A. Boyce, for his advice on the chapter on cataract lens fitting; Dr. Alfred R. Robbins, for his suggestions on the chapter on lens evaluation; and particularly Dr. Paul Boeder and Mr. Henry B. Carpenter, for their many suggestions and criticisms in the margins of the unfinished manuscript.

RUSSELL L. STIMSON

Los Angeles, California
1951

INTRODUCTION

As steadily as the importance and the value of ophthalmic services have been increasingly recognized, so, too, has it been apparent that ophthalmic dispensing will take on a deeper significance.

Rather slow progress was made in the development of improved technique in the ophthalmic dispensing field until the present century was well advanced. It was then appreciated that only by the establishment of educational standards and more advanced processes in training would dispensing keep abreast of the progress of other branches of eye care in its contribution to human welfare.

Independently, in a number of states in this country and in England, schools of higher education were established to afford the student adequate knowledge in scientific and technical subjects applicable to this field and a thorough training in practical procedures.

The dearth of proper textbooks for private and classroom instruction has been a handicap.

The material in this book is a contribution toward visual perfection in that it affords an essential background to those who would render an adequate service in ophthalmic dispensing. Regardless of the knowledge and skill employed in the refraction, the patient can only receive the desired results when the laboratory instructions are accorded detailed consideration, and then only as the completed device is fitted and adapted in accordance with the requirements of the prescription.

There is a need for a coalition of thought and practice that would impart to the refractionist, the student, and the practitioner a more concise appreciation of both the scope and the limitations afforded by a properly compounded and correctly adapted seeing device and the need for a scientific approach to this objective. This was the motivating force that prompted the author to under-

take this manuscript. The results are most gratifying. Many subjects pertinent to the student of dispensing are treated in a manner that should prove invaluable in the classroom and for review by all in the ophthalmic field.

Other books have considered separate phases of this subject. None other has been so comprehensive in treatment of so many of the problems essential to adequate knowledge of the many ramifications involved in dispensing services.

The reader will have a genuine appreciation of the magnitude of the author's efforts and will realize that his lifetime of experience and study well qualified him for the undertaking.

HENRY B. CARPENTER

Syracuse, New York

ACKNOWLEDGMENTS

I wish to express my thanks to the following publishers for the courtesy of the use of excerpts from their publications: King City, Distinguished Service Foundation of Optometry; Boeder, Paul: *An Introduction to the Mathematics of Ophthalmic Optics.* Springfield, Charles C Thomas, 1937; Ogle, K.N.: *Optics.* London, U.K. Optical B & L, Ltd., 1968; Emsley, H.H.: *Emsley's Optical Tables and Other Data,* 1968. Rochester, Shuron/Continental Optical Company, *Pedioptic Frames,* 1961.

After one has used a number of terms and concludes by setting down some of them as a glossary, conscience forces him to refer to authority for clarity and accuracy in his definitions. I have found great assistance in *Dorland's Illustrated Medical Dictionary,* Philadelphia, W.B. Saunders Company, 1961; Schapero, Max *et al.: Dictionary of Visual Science, Philadelphia,* Chilton, 1960; Hardy, Morris and Flick: *A Dictionary for Opticians and Optometrists,* London, Hatton Press, 1951.

R.L.S.

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Ophthalmic Dispensing

Chapter 1

HISTORY OF OPHTHALMIC DISPENSING

Compared with some of the other things manufactured to improve the comfort or well-being of humans, optical lenses and the fitting and dispensing of them as spectacles is comparatively recent. It is unbelievable that in very primitive times someone did not learn that a reasonably transparent material which was made convex on the front surface, like the cabochon cut of a semi-precious stone, would increase the apparent size of anything upon which it was laid. Following that event it is reasonable to suspect that a search turned to the finding of transparent hard materials.

Careful research has failed to disclose any very clear references to lenses in early historical writings. The apparent bending of the end of a straight rod immersed in water was carefully investigated by Claudius Ptolemy, a Greek, 138 A.D., and even the regular increase in the apparent deviation at an increased angle was noted.

Two lenses in a conveyance to rest upon the nose were first mentioned about the end of the thirteenth century. In 1268 Roger Bacon described "the segment of a sphere with the convex side toward the eye with which letters are seen far better and they seem larger. For this reason such an instrument is useful to old persons and those with weak eyes."*

The invention of spectacles is most frequently ascribed to Salvino d'Armati, an Italian, who was mentioned in a statement found on a mural tablet dated 1317 under a bust in the Church of St. Maria Maggiore in Florence. However a letter dated 1299 by Trettato del Governo da Sandra di Pipozzo di Sandro Florentine remarks, "I find myself so oppressed by age that I can neither read nor write without those glasses they call spectacles, lately invented. . . ."

Yet a sermon delivered in 1305 by Fra Giordano da Rivalto

* Flick, C.S.: *A Gross of Green Spectacles.* London, Hatton Press, 1951.

should qualify him as the godfather of all dispensing opticians. He said, "It is not yet twenty years since the art of making glasses was invented. This enables good sight, and *is one of the best as well as most useful of arts that the world possesses.*"

As time went on spectacle makers made the lenses, made the holder (sometimes of leather, wood, or metal) and sold the product at fairs or on the streets from a tray. The selection of lens power was made by the customer. Practically all of the spectacles were used as reading glasses because the first lenses were convex. There seems to be no record of the advent of concave lenses for the help of myopic eyes.

The German opticians formed a guild which was probably the first optical organization.

In 1629 King Charles I of England granted a charter to the Worshipful Company of Spectacle Makers which amounted to a guild. The members controlled the quality of spectacles offered for sale and within the limits of the City of London were permitted to destroy any spectacles that did not come up to standard. Two comments might be made that (a) it was commendable that quality of product was paramount and (b) a sort of cartel was formed which gave reason for the continuance of the organization. The Charter remains active to the present time. Since 1897 it has controlled the education and examinations of all British ophthalmic opticians (optometrists).

Although Benjamin Franklin had split a pair of distance and reading glasses and made the first bifocals in 1784, his letters of about that time indicated that lens power was still the wearer's choice.

Progress in knowledge concerning physiological optics was very slow until about 1800. Thomas Young called attention to astigmatism, but it was not until 1827 that Airy made the first cylindrical lens for the correction of it. This activity was all very limited and did not have much popular support until F.C. Donders, M.D., a Dutchman, wrote his classical text in 1864 entitled *Accommodation and Refraction of the Eye.* It aroused the interest of medical doctors everywhere in the examination of eyes and the prescribing of spectacle lenses for them. Some opticians soon adapted their activities to do the filling of medical doctors' prescriptions.

Others availed themselves of the knowledge in Donders' book and others that followed and vigorously undertook to acquire knowledge and improve their ability in sight-testing and the preparation of individualized spectacle lenses.

As time went on the two groups of opticians continued to concentrate upon their specialized activities until finally they were advertising themselves as "refracting opticians" and "prescription opticians." It was natural that medical doctors and prescription opticians became more closely related in their common cause to treat patients' eyes. Refracting opticians, many of whom were related to jewelry stores, were self-sufficient because they were doing the sight-testing and also supplying the required spectacles.

Cuignet (1873) developed and popularized a means of an objective refracting procedure involving light reflected from the patient's eyes. By the use of a cyclopegic, a drug that hinders the action of the ciliary muscle and thereby retards accommodation, doctors were now able to do a large part of a refraction without the patient's verbal response. This technique called retinoscopy aroused greater interest in eye examinations. The drug (usually atropine or homatropine) also dilated the patient's pupils affording the doctors the opportunity to obtain a better view of the retina and to facilitate diagnosis of systemic, or other, diseases which were affecting eye health.

Some refracting opticians seemed to feel they were existing on sufferance of organized medicine and wished to establish their own legal identity. They chose the name "optometry" (a word used by Donders and others) as the name for their profession and undertook to obtain state licensure to refract eyes without the use of drugs. Although by a strict interpretation of the medical practice acts in many states it was contended by some that refraction was really the province of medicine, state medical societies yielded this small corner to the optometrists when they were assured there was no intention to use licensure as a "back door" approach to the practice of medicine.

Prescription opticians became well established and in some cities the firms operated several stores. In some states the optometry laws had been written so broadly that although a prescription optician was doing no sight-testing and had his entire allegiance

to the medical profession, optometrists contended that these opticians were in violation of the Optometry Act. The only defense in this situation was for the prescription opticians to rally the support of their ophthalmologist friends and obtain some kind of state legislation to be able to continue their businesses. In some other states there was no vigorous agitation about this matter by the local optometrists.

In 1926 a group of dispensing opticians in Philadelphia formed a local, then a national, organization of opticians who were committed to the sole business of caring for medical doctors' patients. Like the original Worshipful Company of Spectacle Makers, a code of ethics was established to enforce high quality service using highest quality materials. This organization was named the Guild of Prescription Opticians of America. Its membership now approaches a thousand member firms. It has its home office in Washington, D.C.; and champions improved education for dispensers. Its legal staff undertakes to thwart any legislation that is construed to be inimical to the progress of dispensing opticians in their care of ophthalmologists' patients.

In 1947 the American Board of Opticianry was formed to assist in the establishment of collegiate courses in opticianry and to certify opticians by examination after five or more years of experience. Those who pass the first examination are known as Certified Opticians and those who pass a second and more difficult examination are certified as Master Opticians. The members of the Board made the original contributions to establish an Educational Foundation in Ophthalmic Optics to provide funds for scholarships and student loans. More recently the International Academy in Opticianry was formed to provide a continuing education for Board Certified opticians and to conduct educational seminars to assist opticians to prepare for the American Board examinations. This organization has more than one thousand Fellows.

Courses in opticianry have grown until there are now seventeen high school and two-year college courses teaching optical technology and complete courses in ophthalmic dispensing. The Department of Labor is vigorously promoting an Apprenticeship

Plan which is being actively supported by established firms across the country.

Thus a vocation that was formerly wholly constituted of apprentices is meeting present-day technological advances by also sponsoring formal education to help fill the ranks of a rapidly expanding occupation.

REVIEW

1. Who was Salvino d'Armati?
2. Describe the Worshipful Company of Spectacle Makers.
3. Discuss Benjamin Franklin's contribution to ophthalmic optics.
4. What was one of Thomas Young's discoveries?
5. Identify F.C. Donders, M.D.
6. When did Cuignet develop the retinoscope?
7. What is the difference between a refracting optician and a prescription optician?
8. What is the name of the national trade organization of dispensing opticians?

ADDITIONAL REFERENCE

1. Sutcliffe, John H.: *British Optical Association Library & Museum Catalogue*. London, Council of the British Optical Association at Clifford's Inn, 1932.