E. LeRoy Ryer (1880-1972) and Elmer E. Hotaling (1887-1950), Optometric Leaders and Authors, and Partners in Optometry Practice

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Abstract
E. LeRoy Ryer and Elmer E. Hotaling were very prominent optometrists of the first half of the twentieth century and made numerous contributions to the profession. They were among the early pioneers of professional optometry practice. They published many articles in optometry journals, and did work in instrument design. They were charter members of the American Academy of Optometry in 1922, Ryer having suggested such an organization in 1905. In the first decade of the twentieth century, they were briefly faculty members in a two-year optometry school, an unusual length of study for the time. This paper presents brief biographical sketches of each, along with discussion of the two books they coauthored, Optometric Procedure and Ophthalmometry. The former book contained much of their views on how optometry should be practiced.

Key words: American Academy of Optometry, Optometric Historical Society, optometry books, optometry history

Anyone doing much reading about optometry in the first half of the twentieth century is bound to run across the names Ryer and Hotaling. They made numerous contributions to optometry, and they authored many professional articles and two books. This paper presents biographical sketches of E. LeRoy Ryer and Elmer E. Hotaling and discusses the contents of their books.

E. LeRoy Ryer (1880-1972)
Elmer LeRoy Ryer recalled that his first playthings “were old lenses, discarded optical instruments, prisms, mirrors, a cherished kaleidoscope and not too much later, concave and convex mirrors, microscope, telescope, and best of all a small spectroscope and a total-reflecting prism.”¹ Both of his parents graduated from the Spencer Optometric Institute, and his father was employed by the Spencer Optical Company in New York as a salesman, office manager, and refractionist. Ryer recalled that his father sometimes took him to work with him on Saturdays and they often stopped to look at the window display of optical goods and drafting instruments in the window of the shop of James Prentice and Son, the son, of course, being Charles Prentice.² One of the items on display was Charles Prentice’s model demonstrating refractive errors and accommodation.
Ryer was a voracious reader and in his early teen years, Ryer prescribed for himself a rigorous reading program of literature, philosophy, history, science, etc. At age thirteen, he was studying Brewster’s *Treatise on Optics* and carrying out some of Brewster’s experiments. At age 15, most of his study was devoted to optics and refraction, and he graduated from Spencer Optometric Institute in 1897. Over the next months, he attended preparatory school, worked in the office of Harry Heath, who had been an instructor in the Spencer Optical Institute, and learned retinoscopy from L.L. Ferguson, a refractionist for the Julius King Optical Company. Then after working briefly for Spencer Optical Company and for Michael Woolf, Ryer established his own practice.

Ryer set up his own practice in 1898. He established it in a professional setting in an upstairs office rather than a street level store. In an unpublished autobiography, Ryer chided revered optometric leaders such as Charles Prentice and Andrew Jay Cross for still practicing in stores at the beginning of the twentieth century. He made the point repeatedly that when he set up he was practicing in an unusual way, optometry then being largely a mercantile rather than professional enterprise. Many of his publications emphasized the importance of professional practice. Koch said that Ryer would be one of the potential answers to the question of “who developed the first wholly professional private optometric practice.”

Ryer was a frequent contributor to optometric periodicals. For example, in the first decade of the twentieth century, he contributed over 300 items to the *Jeweler’s Circular Optical Department* and to the *Optical Review.* With Elmer E. Hotaling, he was author of 20 papers published from 1928 to 1947 in the *American Journal of Optometry and Archives of the American Academy of Optometry.* For over 25 years, he was a book review editor for the *Journal of the American Optometric Association,* contributing numerous book reviews. Ryer was also an inventor. He received patents for devices improving retinoscopy (1900) and indirect opthalmoscopy (1901) and for a rotatable astigmatism chart (1905), and he developed a type of optometer which was called a Ryer Astigmometer.

Ryer was editor of a short-lived publication, *Archives of Optometry* (1922-23). He thought that it did not survive because subscription fees were charged, whereas the competing *American Journal of Physiological Optics* (1920-26) was distributed to optometrists at no charge by the American Optical Company. Ryer also served as an associate editor for *Optical Journal and Review of Optometry* and for the *American Journal of Optometry.*

From 1898 to about 1907, Ryer gave private lessons in optometry at what he called the Ryer Private Optometrical Institute. The student attended until Ryer thought the student “fit to practice.” Ryer was then a faculty member in the New York Institute of Optometry (NYIO). An advertisement for the NYIO in the 1907 *Optical Journal* listed A. Jay Cross as president and E. LeRoy Ryer as secretary. The advertisement said that the school had “an active faculty of six members, each of whom lectures from two to five times weekly.” In 1909, NYIO was a two year school, when there were no
standards for length of study in optometry school and many schools were offering curricula of weeks or months in duration. The faculty were S.H. Brooks, A.J. Cross, E.E. Hotaling, R.M. Lockwood, E.L. Ryer, and F.A. Woll, most of whom were well known in optometric circles. In November of 1909, the closing of NYIO was announced, the reason given being that some of the faculty found it difficult to maintain their private practices while teaching at the school. It appears that ended Ryer's involvement as a regular faculty member in an optometry school.

Beginning in 1906, Ryer served for a few years as president as Physiological Section (later called the Scientific Section) of the American Association of Opticians, the forerunner of the American Optometric Association (AOA). It advocated increased educational standards for optometrists and arranged lecture programs at the AOA meeting until it was disbanded in 1919.

In 1905, as president of the Optical Society of the City of New York, Ryer proposed the idea of an American Academy of Optometry. His address was later published as an editorial in the Optical Journal and Review of Optometry. He explained the need and justification for such an organization and presented guidelines for establishing an academy. Both Hofstetter and Gregg noted that Ryer's concepts for an academy were essentially those of the American Academy of Optometry decades later. In 1912-13, Ryer along with R.M. Lockwood, E.E. Hotaling, N.Y. Hull, and J.H. Drakeford founded the New York Academy of Optometry. Membership requirements included passing an examination and adhering to a code of ethics, one aspect of which was the professional practice of optometry. When the American Academy of Optometry was founded in 1922, Ryer became one of its charter members and one of its most active participants.

In 1908, Ryer published a paper entitled, "My new method of correcting convergent squint." In that paper, he acknowledged Donders as having shown that correction of hyperopia in preschool children can help to eliminate esotropia. Ryer then suggested that treatment for esotropia at near should include bifocal lenses and that such treatment is appropriate not only in hyperopia, but also in emmetropia and myopia, and further that such treatment is to be used in school-age children as well as preschool children. Ryer said: "My method consists of prescribing bifocals and eliminating both near and distance accommodations, instead of giving the usual distance correction only. [p. 21]...My plan is then to consider the use of bifocals in every case of convergent squint, no matter what the refractive condition may be and regardless of the age of the patient." [p.22]

Separate sources give 1912 and 1914 as the year in which Elmer E. Hotaling joined Ryer in practice. Another source says that Hotaling was in practice for 38 years with Ryer, which would put the year at 1912. After Hotaling died in 1950, Ryer was joined in practice by Harold M. Fisher. Ryer retired from optometry practice in 1959.
Fisher recalled that Ryer did not have any hobbies; his only interests in life were his family, optometry, and books. Ryer’s books contained a date (or dates) penciled in on the upper left hand corner of the inside of the front cover, signifying when he had finished reading each book. Ryer’s extensive book collection included books such as Newton’s *Opticks* (1730), Robert Smith’s *Compleat System of Opticks* (1738), and “more than a hundred other books not likely to be found in other private optometric libraries.” Ryer’s bookplate was designed and drawn by his associate E.E. Hotaling. The bookplate design includes a seated figure staring off into space, which Hotaling said was “meant to convey the truth about Ryer – he built castles in the air but kept one foot on the ground.”

Evidence that Ryer was totally absorbed in his work, comes from a pamphlet written by his wife, entitled *The Man Who Examined Your Eyes*. She said: “For a number of years his average day’s work consisted of lecturing from 9 to 10, office hours 10:30 to 4:30 and from 6 to 8, lecturing again from 8:30 to 10, and writing or working in laboratory from 10:30 to 12 or 1:00 in the morning.” This undated pamphlet says that he had published over 450 optometry articles. This pamphlet is the only source where I have found mention of degrees he obtained. It says that he had a D.O.S. degree from the New York Institute of Optometry and an Opt.D. from Philadelphia Optical College.

Maria Dablemont, one of the founders of the Optometric Historical Society and a long-time librarian and archivist for the American Optometric Association (AOA), noted that Ryer “embodied the highest ideals of the profession...He loved the classics and delighted in quoting from them. Very shy, extremely modest, he shunned public appearances. Yet, he was an articulate and persuasive speaker, and could be an indomitable opponent when the cause of optometry was at stake....His speech proposing an academy of optometry was a masterpiece.” Dablemont noted that when Ryer became a history consultant to the AOA after his retirement, “in his own thorough and uncompromising way, he went far beyond what was expected.” He donated books, private papers, museum objects, patents, awards, and memorabilia to the AOA.

**Elmer E. Hotaling (1887-1950)**

One optometric author suggested that Elmer E. Hotaling may have gotten into optometry because his family was friends with Ryer’s family. Hotaling was a graduate of City College of New York. He studied optometry with Ryer. After graduating from the New York Institute of Optometry in 1907, he became a member of its faculty. He graduated from Philadelphia Optical College in 1912.

Hotaling was a co-founder of the New York Academy of Optometry. He served several organizations as president, including the New York Academy of Optometry, the Optometrical Society of New York, and the national Omega Epsilon Phi optometry fraternity. For 17 years, he was book review editor with Ryer for the *Journal of the American Optometric Association*. In 1944, Hotaling and Ryer received the gold medal of the Distinguished Service Foundation of Optometry.
Hotaling was a charter member of the American Academy of Optometry and served on its Executive Council for several years. He also was a member of the editorial board of the American Journal of Optometry. In the early 1930s, he chaired an Academy committee charged with studying the effects of Calobar filters on the progression of age-related cataract.

Hotaling also did some work in instrument development. He and Ryer worked on a visual acuity chart for General Optical Company. Gregg credited Ryer, Hotaling, and R.M. Peckham as being among the first optometrists to do work in orthoptics and vision training.

Two sources mentioned that Ryer and Hotaling developed the concept of “two men examining each case,” but I have not found a description of how they divided up or coordinated examination procedures. Koch expressed the opinion that “Hotaling’s character was distinguished by an unswerving devotion to professional and scientific optometric practice and he was never willing to compromise with less than the best optometric science could offer.”

Ryer and Hotaling’s book Optometric Procedure

Ryer and Hotaling published Optometric Procedure: Basic and Supplementary (x + 94 pages) in 1941. They stated that the purpose of the book was to set forth “the principles which it is believed should underlie the establishment and conduct of optometric practice.” (p. ix) They noted that competence in optometry involved “thorough knowledge of the refractive and muscular anomalies of the human binocular apparatus” and “mastery of instruments that insure precise measurements, dependable diagnosis, and rational corrective procedure.” (p. 11) They discussed the floor plan and furnishings of their office. The floor plan contained two examination rooms, an orthoptics and auxiliary tests room, a consultation room, a reception room, a dispensing room, a laboratory, and a storage closet.

The authors emphasized the importance of ethics and professional practice. They also advocated knowing the history of the profession and having a good library: “Not to know the history of our calling..., the struggles of our pioneers..., and “all that books can tell us,” will “deny ourselves encouragement and inspiration, and reduce immeasurably the chances of success.” (p. 28) They also espoused the consultation of books as a necessary accompaniment to practical experience: “To those optometrists, if there by any, who may be tempted to spurn book-mindedness in the face of practical experience, let us recommend Osler’s kindly suggestion that a well-used library is one of the few correctives of the premature senility which is so apt to overcome all engaged in the daily round of practice.” (p. 29)

Ryer and Hotaling suggested that the necessary elements of an optometry practice were a secretary “to carry out all office detail,” an assistant who was optometrically trained “who relieves you of detail not a necessary part of your work,” and “complete equipment.” (p. 31) They felt that the ideal optometrist was “one who respects his calling; elicits and interprets essential symptoms; differentiates pathological
from functional phases; determines the distinctive nature of monocular and binocular anomalies; corrects or eliminates those anomalies by any means he has mastered; looks forward to ever-widening fields of usefulness; realizes that up to date he has mastered such subjects as geometric, mechanical, and physiological optics, ocular anatomy, physiology, and hygiene, ocular myology and ocular refraction in the broadest sense..." (pp. 35-36) They expressed the opinion that optometrists should not only determine a spectacle prescription, but should also include the selection and adaptation of glasses in the services they provide. The book included examples of appointment forms, billing forms, reminder notices, and other forms.

The authors summarized what they considered “adequate equipment” to be for an optometrist, “and in case he cannot procure it all at once, the order which should be followed in assembling it: A mastery of words; good English, clear thinking, careful phrasing and control; a comprehensive library and the habit of using it; an interpupillary gauge; a master additive-power trial case of highest quality and accuracy; a substantial and easily adjustable trial frame; an accurately calibrated and adequately illuminated test chart; a phorometer; an ophthalmoscope; a retinoscope; an ophthalmometer; a binocular loupe and transilluminator; a malingerer test; at least two tests for color blindness; a set of accurately marked cross-cylinders; a perimeter; a campimeter; a slit-lamp and corneal microscope; a Stere-o-Orthoptor or Metronoscope-photometer; an Ophthalmograph; a Dark Adaptometer; and an Ophthalmoeikonometer.” (pp. 58-59)

They suggested that examinations be orderly and complete, but flexible. They also forcefully noted that dealing with nearpoint discomfort and binocular vision problems was as important as providing clear distance visual acuity: “It is to be feared that the prevailing abject submission to that false god V.A., who dominates distance-test procedure, frequently brings glasses, Optometry and individual standing into disrepute, and will continue to do so until near-work problems, near-work diagnoses and near-work corrections cast off his influence.” (p. 78)

A review of the book said: “For years Ryer and Hotaling have been leading forces in the effort to more fully develop all professional aspects of refractive work particularly as this refers to the practice of optometry. This small volume is full of interesting and practical information dealing with all phases of practice building.”

Ryer and Hotaling’s book *Ophthalmometry*

Ryer and Hotaling published *Ophthalmometry* (xiii + 141 pages) in 1945. It was updated edition of Ryer’s 1925 book with the same title. In the introduction, the authors noted that the real worth of the ophthalmometer and ophthalmometry “has been invalidated as much by dogmatic overpraise as by misguided adverse criticism. Within well defined limits the ophthalmometer does its work superlatively well.” (p. 1) The book provides a comprehensive description of the use and principles of ophthalmometry in optometric practice, including scientific background in the design and use of the ophthalmometer, its use in refraction and applications to the investigation of various conditions, procedures for setting up and performing ophthalmometry, and operation of the Micromatic ophthalmometer. In the discussion of the operation of the Micromatic
ophthalmometer, the authors describe the procedure they developed of using colored mires to aid in more accurate alignment of the mires.

They suggested that the predictive value of calculations such as Javal's rule could be improved by using Neumuller's tables adjusting for amount of spherical refractive error. They also suggested that improvements could be gained by considering patient age. They discussed the relation between ophthalmometer findings and subjective refraction in various conditions, such as amblyopia, aphakia, and cataract. They also noted the fact that it could be used to identify irregular astigmatism.

The authors also present clinical data on various aspects of ophthalmometry. For instance, on pages 38-41, they discuss the relation of anisometropia and difference in ophthalmometer powers between the two eyes. They searched 4,318 cases for cases of anisometropia of 1.00 D or more. Of 415 cases meeting that criterion, only 22 had an ophthalmometer difference which exceeded the amount of anisometropia.

A review of the book said: "The work is well done and includes, of course, much that appeared in Ryer's splendid original book on Ophthalmometry published in 1925. The more recent techniques are presented in clear detail, and the authors review every practical use of the instrument."23

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