HINDSIGHT
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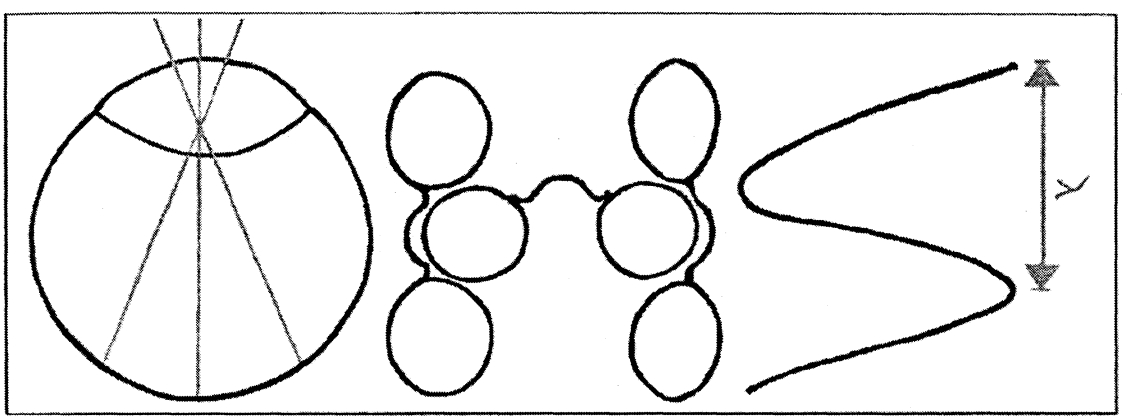
October, 2009
Volume 40, Number 4



Official Publication of the Optometric Historical Society

Hindsight: Journal of Optometry History publishes material on the history of optometry and related topics. As the official publication of the Optometric Historical Society, Hindsight: Journal of Optometry History supports the purposes and functions of the Optometric Historical Society.

The purposes of the Optometric Historical Society, according to its by-laws, are:
- to encourage the collection and preservation of materials relating to the history of optometry,
- to assist in securing and documenting the recollections of those who participated in the development of optometry,
- to encourage and assist in the care of archives of optometric interest,
- to identify and mark sites, landmarks, monuments, and structures of significance in optometric development, and
- to shed honor and recognition on persons, groups, and agencies making notable contributions toward the goals of the society.

The official publication of the Optometric Historical Society, published quarterly since its beginning, was previously titled:
Newsletter of the Optometric Historical Society, 1970-1991 (volumes 1-22), and
Hindsight: Newsletter of the Optometric Historical Society, 1992-2006 (volumes 23-37).
Hindsight: Journal of Optometry History began in 2007 with volume 38, number 1.

On the cover: The drawing represents OHS for Optometric Historical Society: the O an elementary schematic of an eye, the H three intersecting pairs of spectacles, and the S a representation of a light wave with the Greek letter lambda indicating one wavelength. The drawing artist was Diane Goss.

OHS website: www.opt.indiana.edu/ohs/opthohiso.html

HINDSIGHT: Journal of Optometry History
October, 2009
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Manuscripts submitted for publication should be sent to the Editor at the email or postal address above. A Word document attached to an email message is the preferred means of submission. Paper copy submissions sent by postal service will also be considered.

Instructions to Authors

Hindsight: Journal of Optometry History is the official publication of the Optometric Historical Society (OHS), and, as such, supports and complements the purposes and functions of OHS. The journal publishes historical research, articles, reports, book reviews, letters to the editor, and article reviews. The topics of material published in the journal include: history of optometry; history of eye and vision care; history of spectacles, contact lenses, and other corrective devices; history of vision therapy, low vision care, and other vision care modalities; history of vision science; biographical sketches of persons who have worked in or influenced optometry and/or vision science; recollections or oral histories of optometrists and persons who have worked in optometry and optometry-related fields; and related topics.

Material submitted for publication should be sent to the editor: David A. Goss, School of Optometry, Indiana University, Bloomington, IN 47405; dgoss@indiana.edu. Material may be submitted by postal service or by email, although the preferred mode of reception of submissions is a Word document in an email attachment.

Authors who wish to use direct quotations of substantial length, tables, figures, or illustrations from copyrighted material must obtain written permission from the publisher or copyright owner. Short quotations may be acknowledged by quotation marks and a reference citation.

Submissions should include a title, the names, degrees, postal addresses, and email addresses of the authors. Abstracts are not recommended for short articles. Abstracts and key words are recommended but not necessary for longer articles.

Tables and figures should be numbered sequentially in the order that the mention of them appears in the text, e.g., Table 1, Table 2, Figure 1, Figure 2. Each table and figure should have mention or discussion of it in the text of the article. Each table and figure should be accompanied by an explanatory figure legend or table legend. Any article containing tables should be submitted as a Word document attachment to an email message with the tables produced through the table creating function of Word (as opposed to an Excel or comparable spreadsheet).

Extensive use of uncommon abbreviations, symbols, and acronyms is discouraged. Common abbreviations, such as D for diopters or cm for centimeters, may be used. Common symbols, such as Δ for prism diopters, may be used when the context for their use is clear. The first use of acronyms should be accompanied by the name or phrase spelled out followed by the acronym in parentheses, as for example: The Optometric Historical Society (OHS) has produced a quarterly publication since 1970.

Acknowledgments should be placed between the text of the article and the reference section. Sources of support, such as grant funding or other significant assistance, should be acknowledged. The assistance of persons who contributed to the work may also be acknowledged.

References should be placed after the acknowledgments, and for most papers will be the last section of the paper. References should be numbered in order of their citation in the body of the article. Citations should be identified in the text by superscript numbers. Authors are responsible for ensuring that reference listings are correct. Reference format should be as follows:

Journal articles:
Calvo M, Enoch JM. Early use of corrective lenses in Spanish colonies of the Americas including parts of the future United States: reference to Viceroy Luis de Velasco (the son). Optom Vis Sci 2003;80:681-689.

Section in a single author book:
Hofstetter HW. Optometry: Professional, Economic, and Legal Aspects. St. Louis: Mosby, 1948:17-35.

Chapter in a multi-author volume:
Penisten DK. Eyes and vision in North American Indiana cultures: An historical perspective on traditional medicine and mythology. In: Goss DA, Edmondson LL, eds. Eye and Vision Conditions in the American Indian. Yukon, OK; Pueblo Publishing, 1990:186-190.

Citations to articles in *Hindsight: Journal of Optometry History* should be given as follows:
Bennett I. The story behind Optometric Management magazine. Hindsight: J Optom Hist 2007;38:17-22.

If footnotes or notes on additional (minor) details are used, they should be marked in the text with superscript lower case letters starting with a and continuing in alphabetical order. The notes themselves should be the last section of the paper. The heading for the section should be Notes.

Appendix to Rays of Light and the Hands of God: Use of Egyptian Hieroglyphics to Demonstrate Light Rays

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Please note: All dates provided here were taken from the Catalogue of the Egyptian Museum, Cairo, dated 2002. This article is an appendix to the article "Rays of Light and the Hands of God: A Fascinating Egyptian Application!, published in the July, 2009 issue of Hindsight: Journal of Optometry History.

Dr. Chloé Ragazzole [Chargèe de Recherches documentaires Bibliothèque Nationale de France - manuscipts; Centre de Recherches Égyptologiques de la U. Sorbonne, Paris] kindly called the attention of Prof. Enoch to the work of Dr. Holger Kockelmann of the University of Trier, Germany. This gentleman recently presented an interesting paper at a meeting held at the British Museum in London titled: *Sunshine for the dead: on the role and representation of light in the Book of the Dead from the New Kingdom to Ptolemaic times*. Dr. Ragazzole (who also presented a talk at that meeting) properly suggested that Dr. Kockelmann might be knowledgeable about issues associated with the early use of light-rays in Egypt.

Importantly, Dr. Kockelmann pointed out that "Representations of the "shining sun" [= a sun-disc with light-rays indicated], seem to be rare in [Egyptian] pre-Amarnan times indeed [that is, prior to circa 1350 BCE=BC]." He also noted that, "..we do find them in the [Post-Amarna-Period] documents that can be dated to the Egyptian 19th/20th Dynasties [1291-1075 BCE=BC]. After the New Kingdom, i.e., after 1075 BCE=BC, "the shining sun" appears to be occur much more frequently, especially in the Late Period, [664-332 BCE=BC], and the Ptolemaic Periods" [305-30 BCE=BC]." Thus, one assumes there was quite broad use of light-ray representations after 664 BCE=BC.

[Importantly, however] He added, "There are pre-Amarna examples of the shining sun [to be found] in early hieroglyphic scripts! For instance, the sun disc with rays drawn in the form of lines is found as a determinative in the [hieroglyphic] word *"wbn"* = "to rise; to shine" already during the time period 2649-1781 BCE=BC in the Old and Middle Kingdom, so that iconography, as such, was *well* established before the Amarnan age." [Dr. Chloé Ragazzoli, also pointed out that we should look as well at applications of the hieroglyphic word *"itn"*.]

"The Tears of Horus!" Early Use of Hieroglyphics To Demonstrate Light Rays (E-mails from Dr. Holger Kockelmann, U. Trier, Germany 7/28-29/09)

Importantly, Dr. Kockelmann suggested that the sun's rays were used in hieroglyphics in papyrus texts in Egypt from about 2650 BCE=BC onward. Apparently, this occurred a bit later in-time than the drawing of light rays on the Iranian artificial eye (circa 2900-3000 BCE=BC). That is, please realize these time estimates were made in good faith (!), but they are estimates none-the-less! The time period between these two representations is diminishing. Figure 1 (also see Table 1) is one example of use of a known word/phrase which contained the hieroglyphic symbol of a "shining sun" (see the left side of Figure 1).

[Version] [Impressum] List of Egyptian Lemmata containing "wbn". There were 22 such entries listed. [The entire list is not presented here. All entries with the "sun + rays" are displayed with an asterisk (*).] ...The text is in German.

wbn aufgehen; überquellen Wb 1, 292.9-294.3; 294.13
***wbn* Scheinen; aufgehen; herauskommen Wb 1, 292.9-294.3**
wbn überquellen (vom Korn) Wb 1, 294.12
wbn Quelle ("das was hervorkommt") Wb 1, 294.13
wbn [eine Pflanze (aus dem Wadi Natrum)] Wb 1, 295.3
wbn heraustreten Wb 1, 295.4; vgl. Van den Boorn, Duties, 63 ff.
***wbn.w Osten ("Sonnenaufgang") Wb 1, 294.8-9; Lesko, Dictionary I, 111**
wbn.j der Leuchtende (Sonnengott) Wb 1, 294.4; LGG II, 301 f.
wbn.w Sonnenstrahlen Wb 1, 294.7
***wbn.w Osten ("Sonnenaufgang") Wb 1, 294.8-9; Lesko, Dictionary I, 111**
wbn.w Wurzel des Schwanzes ("Herauskommender") Wb 1, 294.14
wbn.w Offene Wunde; Verletzung Wb 1, 294.15-295.2; MedWb 172-178
wbn.w Öffnung (des Netzes) Meeks, AL 78.0924

13 of 22 entries of "*wbn*" (with linked entries) in this dictionary are listed, i.e., these are bibliographical abbreviations of "*wbn*" used in the list-of-lemmata session of Jay M. Enoch, 28 Juli 2009, © BBAW - Ancient Egyptian Dictionary Project.

Table 1. Hieroglyphic Representations of Light-Rays Associated With the Sun in "wbn."

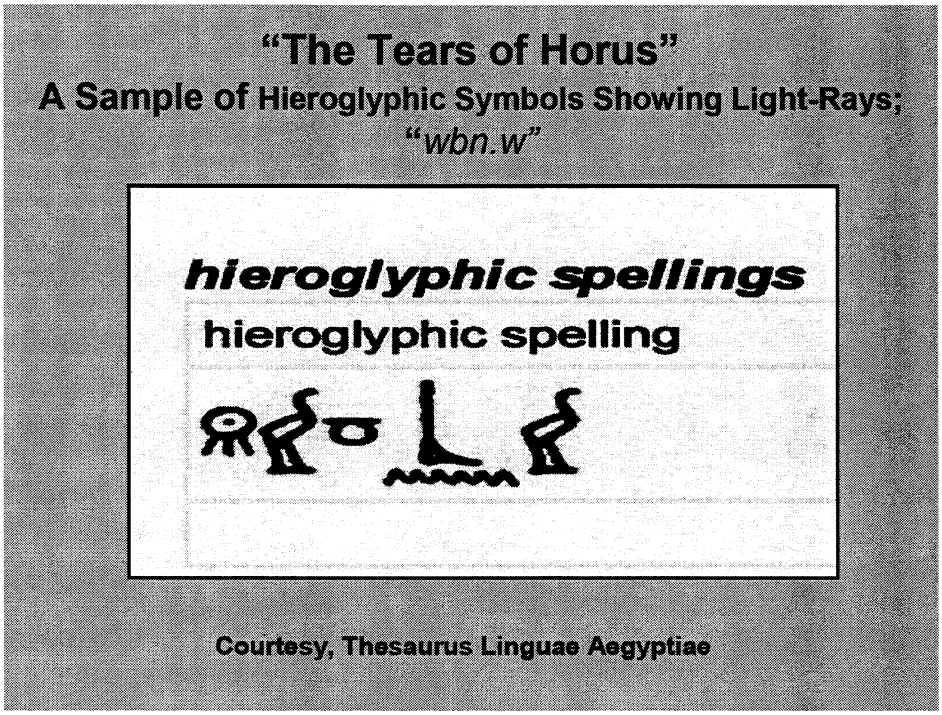

Figure 1. This is a hieroglyphic phrase, which was found in Table 1, under the listing "*wbn.w*". It contains a symbol of a sun with associated rays of light located to the left.

Dr. Kockelmann also remembered a 'Book of the Dead' (BD) document that was produced in the Egyptian 18th Dynasty, one hundred years or so before the Amarnan age."

"In this illustration, in the BD (Figure 2), the sun is shown with rays. It is found in the "Papyrus of Nebqed". This document is located in the Louvre Museum (dated to the time of Thutmosis IV to Amenhotep III, circa 1479-1387 BCE=BC). Dr. H. Kockelmann kindly sent a scan of a facsimile of that figure in that papyrus."

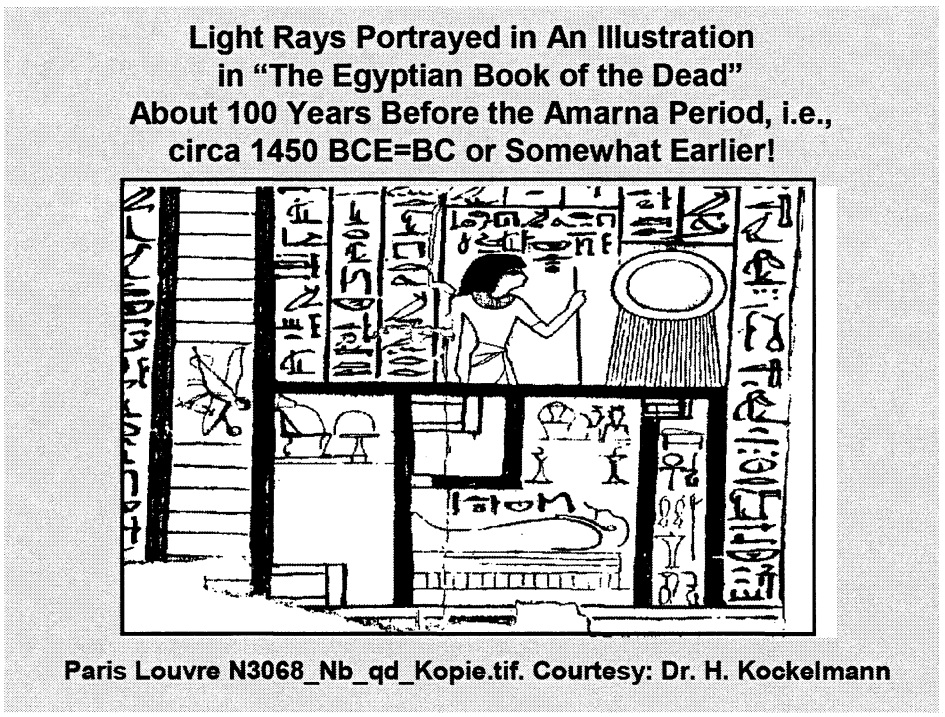

Figure 2. Light rays portrayed in an illustration in "The Egyptian Book of the Dead".

JME asked Dr. H. Kockelmann if, at the ends of these rays of light, there were located the small hands (this comment refers to a discussion of this point in the main paper above). That is, was this feature already present at the time this drawing was made? He (Dr. Kockelmann) responded almost immediately (7/29/09), that, the hands apparently were not present in this figure. He added, the "hands" were a feature of the Amarnan Age. So-saying, he noted, "I know of at least one similar iconography from the Late Third Intermediate Period/Early Late Period (circa 1075-404 BCE=BC) where there was a winged-sun-disk with two arms granting the ankh-sign." [That period of time was after the Armanan Period which was ca. 1350-1333 BCE=BC).] Obviously, such matters are interesting questions worthy of pursuit! The knowledge/fine-insights provided by Dr. Kockelmann are very much appreciated!

[Finally, an interesting supplement to this material (but not really addressing issues considered here) for a reader seeking to understand the then existing Egyptian society, religious beliefs, and eyecare of those times is referred to a comprehensive 2-volume work by Richey Waugh, Jr. *The Eye and Man in Ancient Egypt.* Julius Hirschberg History of Ophthalmology, Vols. 1,2. J.P. Wayenborgh, Publisher, Published at Postbus 196, 8400 Oostende, Belgium. Mr. Wayenborgh now lives in retirement in Paraguay.]

Glimpses of American Optometric Education 100 Years Ago as Revealed in the Pages of *The Optical Journal* of 1909

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Abstract

The Optical Journal in 1909 frequently carried advertisements for optometry schools. On occasion it also published news items on optometry schools and articles on issues in optometric education. The pages of this weekly periodical were examined for information on optometric education of that time. Educational programs varied in length from one month to two years, and some schools offered correspondence courses. Articles published at the end of the year advocated the two year curriculum. Advertisements often listed topics of study at the schools, which included theoretical optics, physiological optics, theoretical and practical optometry, keratometry, skiascopy, ophthalmoscopy, and other subjects. News items from the individual schools indicated that the students in the schools came from various walks of life, including jewelers, watchmakers, pharmacists, medical doctors, opticians, and persons who had already done some work in optometry.

Key words: *history of optometry, optometric education, optometry schools.*

The leading optometric periodical in 1909 was *The Optical Journal*, published by Frederick Boger. It was then in its twentieth year of publication and was published weekly.

One hundred years ago, the term optometry was starting to gain popularity among its practitioners, but it would be some years before it was universally accepted. Around the beginning of the twentieth century, some refracting opticians had started calling themselves optometrists to distinguish themselves from opticians who did not do refractions. The organization that would become known as the American Optometric Association in 1919 was, in 1909, still officially named the American Association of Opticians.

In 1909, there were no university optometry schools. Optometry schools of the time were privately owned for-profit schools. Estimates suggest that from 1872 to 1901, there were 60 optometry schools, and from 1901 to 1914, there were 42 optometry schools.[1] There were no academic requirements for admission to optometry school at that time.[1]

The first optometry licensure law had been passed just eight years before in 1901. By the start of 1909, thirteen states had passed optometry licensure laws, and in 1909, another eleven states would be added to that list.[2] The laws varied widely from state to state in their educational requirements.

The pages of the 1909 issues of *The Optical Journal* were examined for insights into what optometric education may have been like one hundred years ago. Advertisements for various schools were displayed frequently and prominently. There were occasional news items about some of the schools, and the last issue of 1909 included three editorial-like articles on issues surrounding optometric education.

Northern Illinois College of Ophthalmology and Otology

Northern Illinois College of Ophthalmology and Otology (NICOO) had frequent advertisements throughout 1909. And there were occasional "Northern Illinois College Notes" published with other news items. These notes frequently mentioned students and graduates by name, along with their state of origin. Students at NICOO hailed from Alabama, Arkansas, California, Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Missouri, North Dakota, Ohio, Oklahoma, Pennsylvania, South Dakota, Tennessee, Texas, Utah, Washington, Wisconsin, and Canada.[3] In the December 2 issue, it was stated that a brother and sister were attending, and two of the graduates noted as having passed state optometry board examinations were listed as having M.D. degrees.

Notes published in the January 28 issue proclaimed that: "The college is tightening its requirements for graduation on account of the approaching optometry laws of various states."[4] It appears that night courses were popular at NICOO because the "Notes" in the January 28 issue of *The Optical Journal* listed the names of 52 persons who had enrolled for the night session. An advertisement for NICOO in the July 1 issue said that "Our courses are graduated to meet all requirements without hardship to any student from any State."[5] This theme of helping students prepare for state board examinations was exploited in an advertisement in the December 30 issue. The ad stated that all 14 optometrists who passed the Indiana state board were graduates of NICOO.[6] Among these graduates were Hugh Davey, father of John P. Davey, who in the mid twentieth century, would play the leadership role in establishing the optometry program at Indiana University,[7] and George V. Ridgway, who was second in a line of three generations of eye care practitioners.[8]

An advertisement in the February 25 issue boasted that NICOO "Gives the best and most practical course in Optometry" and that "Thorough practical instruction is given in refraction. You can fit glasses properly and be successful in a clean and profitable business."[9] The advertisement also announced that both attendance and correspondence courses were offered and that a night school was in session. Geo. W. McFatrich, M.D., was identified as the secretary of the school, and Masonic Temple, Chicago, was given as an address. NICOO was one of the predecessor schools of the present-day Illinois College of Optometry.

Philadelphia Optical College

The pages of *The Optical Journal* sometimes included "Philadelphia Optical College Notes", usually consisting of short notes on students and graduates. Typical of these entries is the following: "Isidore Kahn, of Washington, D.C., who was formerly in the jewelry business, is taking a thorough attendant course with the view of devoting himself to optometry exclusively."[10] Locations from which their students hailed included Connecticut, Florida, Massachusetts, New Jersey, New York, North Carolina, Pennsylvania, Tennessee, Virginia, West Virginia, Manitoba, Barbados, and Panama.[11]

Varied backgrounds of students could be observed in the "Notes" from the August 5 issue. One was a watchmaker and engraver, one a jeweler and optician, and one had been in the "mercantile business". Some were new to optometry, but some had done previous work in optometry. One was a pharmacist and sought "to combine optometry and pharmacy". Another had taken a partial course in 1897, and was returning "to complete his work".[12]

One paragraph in the February 4 "Notes" identified an early female optometry school instructor: "The students are all pleased with the courteous attention given them by Miss Nettie M. Stone of Enfield, Mass., who graduated in 1907 and is assisting Dr. Brown in the college work. She is always ready to assist the student and explain the difficult points and nothing is too much trouble for her."[13] The Dr. Brown referred to is undoubtedly Christian Henry Brown, M.D., who operated the Philadelphia Optical College.

Advertisements for the Philadelphia Optical College announced that they offered six month, three month, one month, special and post graduate courses, night courses, and correspondence courses. One advertisement said that "twenty years ago we originated the Correspondence System of teaching Optometry".[14] Another said that some of the courses in their curriculum were: "Mathematics and Geometry (as necessary), Physiologic and Applied Optics, Theoretical, Practical and Subjective Optometry, Skiascopy, Ophthalmoscopy, Keratometry, Perimetry, Pathology, Ocular Anatomy and Physiology, Mechanical Optics."[15] In an advertisement in the December 9 issue, they announced that they had "recent additions to our teaching force and enlarged and improved quarters."[16]

New York Institute of Optometry

An advertisement for the New York Institute of Optometry (NYIO) said that they "teach Theoretical Optics, including the laws of reflection and refraction, as applied to mirrors, lenses, prisms and optical instruments. Practical Optics, including the mounting, construction, and adjusting of lenses and prisms. Physiological Optics, covering the dioptric functions of the eye, its anomalies, and their correction by lenses. Theoretical Optometry, covering the principles involved in the methods and instruments used in detecting and measuring the anomalies of the eye. Practical Optometry, covering the demonstration and use of mechanical appliances for measuring the powers of vision. Anatomy, Physiology and Hygiene, including also Ocular Pathology."[17] The advertisement procalimed NYIO to be "America's Ideal Optometrical College" and

included photos of A. Jay Cross, D.O.S., President and Prof. Objective Optometry, and E. Le Roy Ryer, D.O.S., Secretary and Prof. Physiological Optics.

The January 28 issue of *The Optical Journal* contained a section headed "New York Institute of Optometry Notes" in which a number of students were mentioned by name. Most of them were from the state of New York, but there were also students from Georgia, Massachusetts, Ohio, and Rhode Island.[18] The faculty of NYIO, most of whom may be recognized as authors of optometry books, were E.E. Hotaling, E. Le Roy Ryer, A.J. Cross, R.M. Lockwood, S.H. Brooks, and F.A. Woll.[19] NYIO did not offer correspondence courses.[20] In 1909, the state of New York started requiring a two year optometry course for new optometry licentiates.

An advertisement for NYIO in the June 3 issue stated that they were offering the "New York State Standard Two-Year (18 months) Course. Complete One-Year (7 to 9 months) Course for Out-of-State Applicants. Post-Graduate Courses for Optometrists and Physicians. Special One-Month Courses on Specific Subjects for Advanced Optometrists."[21] The June 3 issue also carried a photo of a class of NYIO students and the faculty (see Figure 1). In the July 29 issue, NYIO announced a two week "Post Graduate Course" from August 16th to 28th for $35, in which there were to be 75 special lectures on muscle tests and corrections, dynamic and static skiametry, perimetry and keratometry, ophthalmoscopy, frame fitting, and transpositions.[22]

On November 25, the closing of NYIO was announced. The primary reason given was that some members of the faculty had resigned due to the difficulty of maintaining their private practices while teaching at the school.[23] One week later it was announced that the Optometrical Society of the City of New York was to take over the management of NYIO. The Board of Trustees appointed for that purpose were: E. Le Roy Ryer, Chairman; P.A. Dilworth, S.H. Brooks, Elmer E. Hotaling, F.W. Blair, Albert Cohen, and R.M. Lockwood.[24] One could speculate that those efforts may have been superceded by the founding of the optometry program at Columbia University in 1910.

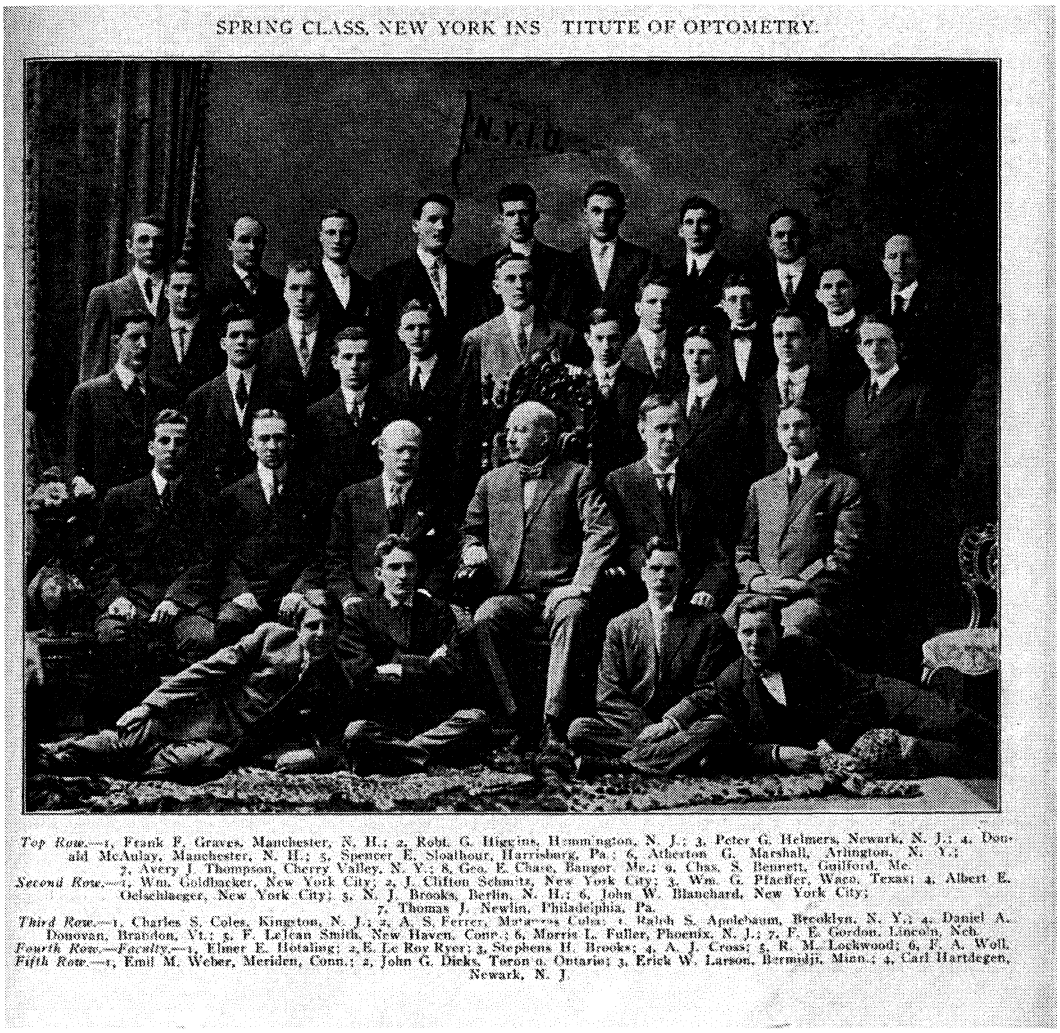

Figure 1. A class of students and the faculty at the New York Institute of Optometry in 1909. The faculty are the persons seated in chairs. They are, left to right: Elmer E. Hotaling, E. Le Roy Ryer, Stephens H. Brooks, Andrew Jay Cross, Robert M. Lockwood, and Frederic A. Woll. (From *The Optical Journal*, June 3, 1909, volume 23, number 23, page 923)

Rochester School of Optometry

An advertisement for the Rochester College of Optometry (RSO) in the February 25 issue put forth that "Its Graduates are successful Optometrists practicing in all parts of the United States" and that "Students prepared for any State Board Examination."[25] A news item in the April 29 said that graduates of the Rochester School of Optometry had a granite tablet placed at the gravesite of Dr. Arthur H. Bowen at Waterford, Ohio, with the permission of Bowen's widow and family. The tablet read "Dedicated to the memory of our beloved friend and teacher, Dr. A.H. Bowen, by the graduates of Rochester School of Optometry."[26]

The June 17 issue of *The Optical Journal* explained that the Rochester School of Optometry was organized in 1902 by Dr. A.H. Bowen and B.B. Clark. Bowen who was "a physician of many years experience," served as president. B.B. Clark was a former

president of the American Association of Opticians. After Bowen's death, Clark took over as president of RSO, and Chas. S. Hawkins as secretary-treasurer. RSO offered coursework only by attendance rather than by correspondence. It was announced that RSO would move to a two year program of instruction.[27]

A September 30 advertisement mentions a two year program and lists the faculty as follows: Howard D. Minchin, Ph.D., Prof. of Physics; W.H. Doane, M.D., Prof. of Ocular Pathology; W.W. Winans, M.D., Prof. of Anatomy, Physiology,and Hygiene; B.B. Clark, Prof. of Subjective Optometry and President; H.M. Bestor, Prof. of Objective Optometry; C.S. Hawkins, Prof. of Theoretical and Practical Optometry and Secretary; E.H. Silver, Prof. of Physiological Optics; Arthur E. Surdam, Prof. of Mechanical Optics; Hon. John J. McInerney, Prof. of Optical Jurisprudence; and W.W. Page, Prof. of Practical Advertising and Business System.[28] An October 30 advertisement for a post graduate course said that "Individual instruction can be arranged for any branch of Optometry which you feel the need of 'brushing up' on, including Anatomy, Physiology, Mathematical Optics, Skiametry, Physiological Optics, Ophthalmoscopy, muscle work, etc."[29]

Los Angeles Optical College

Advertisements in early 1909 for the Los Angeles Optical College said that it had "established a Six Months' Course of study and practice as a *basis* for the Degree of Doctor of Optometry and Ophthalmology for those who desire to engage in this work as a profession after being properly qualified for it. Regular diploma, without degree, given for general proficiency. Advanced standing given to State Licentiates and graduates of this or other optical colleges who take Post Graduate work here to prepare for the Degree. A student can enter at any time....No correspondence course."[30] Readers were advised to address M.B. Ketchum, M.D., President, 510 Temple Auditorium, Los Angeles, Cal. for information.

A later advertisement said that: "At this writing, May 13th, we have in attendance 21 students, some of which are medical and osteopathic practitioners as well as graduates of different Eastern Optical Schools. Our classes are usually about this number as students are coming or going every few days."[31] They were preparing for to offer a two year course for the first time: "We herewith announce complete preparation for any period or Course of Instruction now required by any State in the Union. Our every facility for imparting knowledge in Optometry and Ophthalmology cannot be excelled and a student can enter at any time and get his credits according to his attendance."[31]

In November of 1909, an announcement was made that Los Angeles Optical College had consolidated with another Los Angeles school, the Southern California Eye College. The affiliation would form the Southern California College of Optometry and Ophthalmology with the following officers: Dr. T. Jefferson Ruddy, president; Dr. M.M. Ring, secretary-treasurer; and Dr. M.B. Ketchum, dean. There were plans to have a six months daily attendance course, as well as an evening course which would meet two to three nights a week.[32] According to Gregg,[33] that affiliation lasted less than two years,

and in 1911, M.B. Ketchum had re-established his school with the new name of the Los Angeles Medical School of Ophthalmology and Optometry. That school would eventually lead to the Southern California College of Optometry of today.

Massachusetts School of Optometry

The Massachusetts School of Optometry was previously known as the Klein School of Optics. Some advertisements in 1909 still carried both names. As, for example, one on July 29 said that the Massachusetts School of Optometry "and Klein School of Optics, offer the most complete courses in Optometry, Optics, Chemistry, Bacteriology, and Physics demanded of the up-to-date optician. For further information, address Dr. August A. Klein, 185 Summer Street, Boston, Mass.[34]

In the September 2 issue of *The Optical Journal*, an advertisement announced for the Massachusetts School of Optometry that: "Entrance examinations will be held Oct. 1st and 2nd, from 1:00 to 5:00 PM. All students who have a certificate from a High School of two years attendance are admitted without examination. All who can not pass the examination are allowed one year to study up any subject in which they are deficient."[35] A December 30 ad said that a two year course was available for $200 and a one year course for $100. In addition, special and three month courses were also given.[36] The Massachusetts School of Optometry over time became the New England College of Optometry.[37]

Eberhardt's Correspondence Course

John Eberhardt was president of the American Association of Opticians from 1903 to 1904 and more than anyone is recognized as the champion for the adoption of the term optometrist.[38] Hofstetter[39] referred to Eberhardt as "greatly admired." An advertisement in the February 25 issue of *The Optical Journal* made the following announcement: "Since writing 'Dynamics of the Ocular Muscles,' and 'Prisms in Ocular Practice,' numerous requests to give instructions in these subjects have been received from practitioners who find it impossible to take advantage of attendance courses, yet are desirous of perfecting themselves in advanced methods. After much consideration in which the advice of representative authorities was solicited, I have decided to offer my services as: Tutor in Objective Optometry and Analytical Phorometry. Instruction will be entirely by correspondence, and will be adapted to the individual needs of each student. The course will include thorough coaching in Retinoscopy, Ophthalmometry, and original methods for determining and correcting deficiencies of the ocular muscles. Only such as have a working knowledge of optics will be accepted..."[40]

A July 29 advertisement contained the following endorsement from H.J. Cook, president of the American Association of Opticians: "The advantages of instruction from one who is acknowledged as possibly the highest authority in optometrical science cannot be questioned and will most certainly contribute to the advancement of our profession."[41]

Manhattan School of Optics of the City of New York

The Manhattan School of Optics was a frequent advertiser in the pages of *The Optical Journal* in 1909. Officers of the school were Mark Miller, President; Maxwell Miller, M.D., Vice-President and Treasurer; Samuel M. Miller, Secretary; and Richard A. Hamilton, M.D., "Aided by an Active Faculty of Professors in Every Branch."[42] Excerpts from their February 25 advertisement say that: "A Chair of Special Diagnosis of Eye Diseases has been added to the course. Regular and Continuous Lectures will be delivered on the various Diseases of the Eye by physicians of long experience in the field of special eye work both in this country and abroad....This course added to that already taught in this College will be incalculable benefit to all who avail themselves of the opportunity of securing valuable information given by few if any colleges in this country....Conducting the very best attendance and correspondence courses, thorough in every respect, covering the entire field of modern optics. We teach you all there is to know in Optometry and Ophthalmology, so as to surely enable you to pass the most rigid examinations. We teach you how to properly fit glasses and obtain the best results, assuring a successful Profession for a Lifetime. Classes are continually forming, so that you may enroll at any time, or individual instruction by appointment. Elegantly engraved diplomas granted on completion of course..."[42]

Usually the advertisements for the Manhattan School of Optics took up the top half of a page in the journal with an ad for the Metropolitan Optical Works taking up the bottom half of the page. The address for the Metropolitan Optical Works was the same as one of the addresses for the Manhattan School of Optics. In the Metropolitan Optical Works ad, Mark Miller, presumably the same person as the president of the Manhattan School of Optics, is identified as "Importer, Exporter and Manufacturer of Optical Goods."[42]

A news item in the April 1 issue noted that the Manhattan School of Optics had formed an affiliation with a school in New Jersey: "The University Optical College, of New Jersey, has just been incorporated by the members of the Manhattan School of Optics, and are established at the rooms of Judge Sorenson, 25 Montgomery Street, Jersey City, N.J. The officers are the same as in the Manhattan School, and the same efficient methods of instruction will be employed in order to make it one of the most prominent schools in the country. The incorporators are Mark Miller, Maxwell Miller, Samuel M. Miller, F. Marsh Soper, M.D., and Geo. C. Norris."[43]

Southwestern Optical College

The June 3 issue had this advertisement for the Southwestern Optical College in Kansas City, Missouri: "Dr. S.W. Lane, President. Something New! Our practical method of optical instruction, which makes the mysteries of fitting lenses to the eyes, the adjustment of eyeglass and spectacle frames, prescription writing, straightening cross-eyes with lenses and laws of health and their application easily understood, will in the future be demonstrated by our new system, Projection and Photo-Micrographic Apparatus. Reference, fifteen hundred graduates. Particulars and New Catalogue, address The Southwestern Optical College (Incorporated and Chartered), 1023 Grand Ave., Kansas City, Mo."[44]

There was at least one significant admirer of this school. M.B. Ketchum, of the Los Angeles Optical College and the Southern California College of Optometry and Ophthalmology, gave his opinion that there were five good schools in the United States in late 1909: "the Rochester School, McFatrich, of Chicago, Tarbox, of Omaha, Lane, of Kansas City, and our school here."[45]

Other Schools

A limited amount of information about a few other schools could be gleaned from advertisements. *The Optical Journal* frequently ran small ads from the Horological Department of Bradley Polytechnic Institute, in Peoria, Illinois. The ads said that: "We teach Watch Work, Jewelry, Engraving, Clock Work, Optics."[46]

An advertisement for a correspondence course and diploma from The Physicians' and Surgeons' Optical College in Denver, Colorado, appeared in the June 3 issue. Dr. J.W. Bailey was listed as president and M.E. Reichwald, Opt.D., as the secretary of the school. The ad said: "Our course is published in the State Baord Examination form with answers to each question, thus enabling the student to practice anywhere in the world. The title 'Doctor of optics' (printed on diploma) is conferred upon each graduate. Size of diploma, 16 X 21 inches. Course and diploma sent by return mail to practicing Optometrists for only $5.00. Fee to beginners, $25.00."[47]

In December, 1909, the Iowa College of Optometry in Des Moines announced a 30 day special course starting January 5, 1910, and the first year of a regular course starting February 10, 1910. Their advertisement proclaimed that they had "The Most Complete Equipment for all Branches pertaining to Optometrical Science and Ophthalmology." Listed as faculty were E.H. Hazen, M.D., President; H.L. Rowat, B.S., M.D.; C.M. Post, D.O.; W.E.D. Rummel, A.M., LL.B., Treasurer; Geo. J. Feige, Oph.D., Secretary.[48]

The existence of another school could be implied by an advertisement for a book. In January, there was an ad for a book entitled *Ocular Refraction and the Shadow Test* by the late Frederick A. Bates. Bates was said to have been "Optician and President of the New York School of Optometry."[49]

Articles on the Status of Optometric Education

In the December 30, 1909 issue, The *Optical Journal* celebrated its twenty year anniversary by publishing a number of articles on various topics, including three articles on the status of optometric education. The first of the articles was by M.B. Ketchum, M.D., President of the Los Angeles Optical College and later Dean of the Southern California College of Optometry and Ophthalmology. Ketchum advanced that essential elements of a successful school are individual personal instruction, being equipped with the principal modern instruments used in the profession, and selection of useful textbooks.[45] Ketchum said the textbooks he found to be most useful were: Henderson's *Lessons* (presumably *Lessons on the Eye*, by F.L. Henderson, the third edition of which was published in 1903); *Thorington's Refraction and How to Refract;* both volumes of *The Optician's Manual*; *Clinics in Optometry;* Valk's *Squint* (*Strabimsus, or Squint,*

Latent and Fixed was published by Francis Valk in 1904); Lewis' *Optical Dictionary*; and Haab's *Internal Diseases of the Eye* and *External Diseases of the Eye.*

Ketchum[45] suggested that in the first three months of training, the student should be able demonstrate knowledge of "anatomy of the eye, ametropia, light, lenses, transposing, neutralizing, etc." Then he said the student should be "better able to take up the deeper studies, such as amblyopia, asthenopia, the practical use of the different instruments and trial case, as well as the study of diseases." He also gave the opinion that state licensure laws should not require specific numbers of hours of instruction in particular areas, but instead curricular design should be the responsibility of the schools.

A second article on optometric education was written by Andrew Jay Cross. A.J. Cross was the second person to serve as president of the American Association of Opticians, and he was president of the New York Institute of Optometry. He argued that elevation of the standards of optometric education will benefit the profession and the public. One point he made was the importance of an understanding of theory: "Many old optometrists of long practical experience confess their weakness when it comes to questions of theory. Similar excuses were put forward in medicine and dentistry in their early days, but now it is well known that practitioners whose theories are well grounded have a decided advantage over those who are termed 'empirics'."[50]

Cross further emphasized high standards when he said that "efficient schools of optometry must be maintained or else the calling, as a distinct profession, will disappear from off the earth; neither night, correspondence nor mediocre schools of any kind whatsoever will suffice, no matter whether they are run by societies, corporations or individuals."[50]

Cross gave as an example of "exacting standards" those that were mandated by the Department of Education of the State of New York. They prescribed course work in trigonometry, physics, theoretic optics, physiological optics, and anatomy and physiology of the eye for the first term of the first year; and physics, theoretic optics, physiological optics, practical optics, and theoretic optometry for the second term of the first year. For the second year they required theoretic optics, physiological optics, theoretic optometry, practical optics, and pathological conditions of the eye in the first term; and theoretic optics, physiological optics, practical optics, theoretic optometry, and practical optometry in the second term.[50]

The third of the articles relating to optometric education in the twenty year anniversary issue of *The Optical Journal* was an article by Harry Martin Bestor, who was a faculty member at the Rochester School of Optometry. Bestor supported the two year program despite the warnings of some that such requirements were too stringent. Bestor observed that "if optometry is to take a serious and dignified position among professions it seems to me that a two-year course is none too long, and could not be shortened, when you consider the mathematics of the course alone could not be crowded into lesser time."[51] Bestor further suggested that: "The weeding out of the

charlatan and spectacle peddler by optical laws, and the planting in their places of a dignified and educated class of practitioners, will eventually give to optometry the moral and active support of other professions and the general public."[51] Bestor also appealed to readers with the observation that "with the general recognition of optometry surely their services will become more valuable and compensation therefore greater."[50]

Closing Comments

In 1909 there was a multitude of optometry schools, which varied widely in the length of required study and, undoubtedly, the quality of their programs. Programs varied from one month to two years. There were both attendance schools and correspondence schools. In the intervening one hundred years, the number of years of optometry school increased gradually to the four year curriculum today, and the academic entrance requirements increased from nothing for most of the 1909 schools to the three to four years of pre-optometry university study today. Nevertheless, we can see some of the seeds of present-day optometric education in some of the schools of 1909.

References

1. Hofstetter HW. Optometry: Professional, Economic, and Legal Aspects. St. Louis: Mosby, 1948:297.
2. Arrington EE. History of Optometry. Chicago: White Printing, 1929:26-27.
3. Northern Illinois College Notes. Optical J 1909;23:219,657,851; 1909;24:903.
4. Northern Illinois College Notes. Optical J 1909;23:219.
5. Optical J 1909;24:81.
6. Optical J 1909;25:35.
7. Goss DA. History of the Indiana University Division of Optometry. Indiana J Optom 2003;6:28-74.
8. Goss DA. Three generations of eye care practitioners – the Ridgways. Hindsight: Newsletter Optom Hist Soc 2003;34:7-11.
9. Optical J 1909;23:383.
10. Philadelphia Optical College Notes. Optical J 1909;23:831.
11. Philadelphia Optical College Notes. Optical J 1909;23:245,614; 24:261-262.
12. Philadelphia Optical College Notes. Optical J 1909;24:261-262.
13. Philadelphia Optical College Notes. Optical J 1909;23:245.
14. Optical J 1909;23:235.
15. Optical J 1909;24:inside back cover facing p. 760.
16. Optical J 1909;24:936.
17. Optical J 1908;23:39.
18. New York Institute of Optometry Notes. Optical J 1909;23:218-219.
19. Optical J 1908;23:46.
20. Optical J 1909;23:347.
21. Optical J 1909;23:895.
22. Optical J 1909;24:199.
23. Closing of the New York Institute of Optometry. Optical J 1909;24:828.
24. The Work of the New York Institute of Optometry Goes On. Optical J 1909;24:904-905.

25. Optical J 1909;23:347.
26. Optical J 1909;23:744-745.
27. Optical J 1909;23:979-980.
28. Optical J 1909;24:540.
29. Optical J 1909;24:711.
30. Optical J 1909;23:196
31. Optical J 1909;24:40.
32. Consolidation of California Optical Schools. Optical J 1909;24:781.
33. Gregg JR. Origin and Development of the Southern California College of Optometry, 1904-1984. Fullerton, CA: Southern California College of Optometry, 1984:10.
34. Optical J 1909;24:234.
35. Optical J 1909;24:352.
36. Optical J 1909;25:36.
37. Moline SW. Century of Vision, The New England College of Optometry: An Anecdotal History of the First Hundred Years. Boston: New England College of Optometry, 1994.
38. Gregg JR. American Optometric Association – A History. St. Louis: American Optometric Association, 1972:22-23.
39. Hofstetter HW. Optometry: Professional, Economic, and Legal Aspects. St. Louis: Mosby, 1948:90.
40. Optical J 1909;23:350.
41. Optical J 1909;24:202.
42. Optical J 1909;23:322.
43. Optical J 1909;23:579.
44. Optical J 1909;23:938.
45. Ketchum MB. The best methods for an optometrical school. Optical J 1909;25:61-62.
46. Optical J 1909;21:135.
47. Optical J 1909;23:896.
48. Optical J 1909;24:884.
49. Optical J 1909;23:222.
50. Cross AJ. Higher education in optometry: a plea for appreciation and co-operation. Optical J 1909;25:82-85.
51. Bestor HM. Two-year course not too long. Optical J 1909;25:108-109.

Gideon Lang and the Blind Pension Law Change of 1950

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In 1950, optometrists were not permitted by Federal Law to ascertain if a patient's corrected visual acuity was sufficiently poor to qualify for a blind pension. Optometrist Gideon Lang of Concord, North Carolina, a recently discharged veteran of World War II, saw how grossly unfair this was and set out to change the law.

Gideon Leon Lang grew up in Concord.[1] His father started an optometry practice there in 1909. Lang attended Pennsylvania State College of Optometry in the late 1930s. He entered military service in World War II. Not sure what an optometrist did, military superiors initially assigned him to be a cook. When his optometric skills were recognized, he was reassigned to performing optometric examinations.

After his military service was completed in 1945, Lang was honorably discharged at the rank of Captain,[2] and he took over his father's practice. He served his community and state in a number of ways. For example, as chairman of the local school board, he worked for integration of schools.[2]

Gideon Lang also made numerous contributions to the optometric profession. These contributions were recognized in his election to the Optometry Hall of Fame in 2006. Lang died in June, 2009 at age 88 and was buried in Arlington National Cemetery.

What follows is an excerpt from an article written by Dr. Lang on changes in optometric history published in the *Journal of the American Optometric Association,* volume 60, number 5, May, 1989, pages 391-404, reproduced here by permission of the American Optometric Association.

"Before, during and after World War II, services for indigent persons who needed eye care and glasses were furnished by local welfare agencies, state welfare agencies and health agencies, and Lion's Clubs. School vision screenings were performed by nurses and teachers and the "E" Snellen Chart was used. Optometrists were not allowed to participate in screenings or to provide eye care services. In fact, if a school child was found to have a visual defect, the parent was told by the nurse that the child should be taken to an eye physician. In many cases the parent was told not to take the child to an optometrist because he or she could not use drugs and could not perform an adequate examination.

"Those in authority at the state level set up the programs for the visual assessment of welfare patients. In North Carolina there were clinics at the medical schools in Departments of Ophthalmology, and residents would examine these patients. There were two or three established eye clinics in a few very large cities; the Variety Club and the Lions Club were the sponsors and ophthalmologists would staff these clinics a day or so a week. In the smaller towns, there were clinics in the offices of EENT practitioners, and in addition to all of these there were clinics at the state welfare departments in the "halls." Usually a resident from the medical school would perform the examinations, using an ophthalmoscope, trial frame, phoropter, trial case, retinoscope

and pen light. The resident was paid $2 per patient, although later a lump sum was given for a day's work at the clinic. A welfare patient was not allowed to see an optometrist, even after receiving the glasses prescribed (which were received by mail), but patients would bring their glasses to optometrists anyway.

"The policy was discriminatory because it denied patients freedom-of-choice as to who would examine their eyes. In North Carolina, the state optometrists decided that enough was enough. The North Carolina employed E.T. Bost, Jr., an attorney from Concord, and a powerful force in the General Assembly (later to become speaker of the house).

"Our group visited the executive director of the North Carolina State Commission for the Blind to discuss our problem. The executive director informed us plainly that we could not participate in eye care services because of a federal law. Title 10 of the Social Security Act stated: "In determining whether a person is blind, there shall be an examination by a physician skilled in diseases of the eye". It was the view of the commission that this law precluded optometrists from participating. We informed the official that our interest was not to certify blindness for pensions but simply to allow people to choose their own practitioner. He stated it could not be done. Bost advised us to go to Washington to change the law.

"Amendments originated in the Ways and Means Committee of the U.S. House of Representatives. The chairman of the committee was Robert L. ("Muley") Doughton, who was from my own [Lang's] congressional district. He was nicknamed "Muley" because once he made up his mind on a subject he was "as stubborn as a mule." Doughton was over 80 years of age but was sharp as a tack. He was the second most powerful man in the House due to his position and seniority. Dr. John High of Rocky Mount was president of the North Carolina Optometric Society and he and I naively went to Washington to "change the law." We did not know any better, and it was good that we were so ignorant. Fortunately for us, Doughton had a daughter named Reba who pretty much ran the Ways and Means office and who was a character in herself. Reba took to Dr. High and myself and correctly surmised that we needed help. I had been active in Democratic politics in my county in the late 1940s and had served as president of the Young Democratic Club. Our county was the county which elected Doughton, so extra consideration was shown to us.

"Doughton had difficulty understanding why we needed to change the Social Security Act, but with Reba's assistance we were able to convince him of the discriminatory nature of the law, and Doughton placed into HR 6000 of 1950 the following language: 'In determining whether a person is blind, there shall be an examination by a physician skilled in diseases of the eye, or *by an optometrist, whichever the individual may select.'*

"Dr. High and I notified MacCracken (note: Bill MacCracken was then the AOA lobby in Washington) of our surprising success, but other AOA officials really did not grasp the significance of what we were trying to do. Doughton held no hearings on the bill in the Ways and Means Committee and allowed no debate on the House floor, demanding that the House either accept the bill or kill it. The bill passed without any problem and was duly sent to the Senate.

"With our bill equating optometry with ophthalmology half way through the Congress, AOA officials perked up their ears, joined forces with us, and together

prepared for a hearing before the Senate Finance Committee. At this point ophthalmology and the American Medical Association (AMA) rang the firebell. One must remember that there was no AOA office in Washington just Mr. Mac. Dr. High and I went to the office of the Senate Finance Committee and naively asked about the hearing procedure. The lady who was the administrative assistant to Senator Walter George of Georgia – the Chairman of the Finance Committee – was a former roommate of the wife of a prominent Athens, GA optometrist, named Chickie Matthews. I sometimes think that the Good Lord was looking after us because this lady took an interest in our problem and helped us immeasurably.

"Our primary concern was the opposition we would face from the American Medical Association; but the National Society for the Prevention of Blindness also entered the fight in support of ophthalmology. We agreed among ourselves to offer a compromise version of the bill, and a "watered down" amendment was proposed to the Senate committee. The day before the hearings, Dr. and Mrs. Matthews came to Washington, entertained Senator George and his wife (and the administrative assistant and her husband), and afterward Senator George was on our side. When the chairman is with your cause, it is difficult to kill a bill. After the hearing was held and our compromise was accepted, we all went into the Senate dining room and had lunch together, smoking the peace pipe with the opposition. Dr. John O'Shea, then president of AOA, testified for optometry, as did I. Harold Kohn, Dr. Joe Babcock and MacCracken were all present.

"When HR 6000 came to conference (because of the two different versions of the bill passed by the House and the Senate), Doughton was true to his nickname. He refused to consider the "watered down" amendment of the Senate, and he argued for 3 hours in favor of the House version. Dr. High and I had not bothered to inform Doughton about our "watered down" amendment, as we thought that those on the Senate side would tell him. The bill was passed by the conference committee containing the optometric amendment exactly as Doughton had proposed it: equating optometry with ophthalmology, the first federal law passed by optometry and signed by the president. The law still stands today. Doughton knew more that Dr. High, the AMA, the AOA officials, or me. Again, I felt that the Good Lord has looked after me.

"The language of HR 6000 was to be used again in Title 16 and in Title 19 (Medicaid). Because of Doughton's persistent advocacy of our original bill, the AMA accused us of a double cross, but that was not the case, as we assumed that Doughton would go along with the Senate version."

References

1. Nimocks A. Dedicated optometrist broke through boundaries. The News & Observer. Raleigh, Durham, Cary, & Chapel Hill, North Carolina, July 20, 2009. http://www.newsobserver.com/news/story/1613713.html. Accessed September 14, 2009.

2. Passing of Dr. Gideon Leon Lang, Father of Professor Mann. Inside MC Online, Montgomery College, Montgomery County, Maryland, June 19, 2009. http://insidemc.montgomerycollege.edu/showStory.php?id=11371. Accessed September 14, 2009.

Nineteenth Century English Optician John Browning and his Book *How to Use our Eyes*

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Abstract

John Browning (1835-1925) was well known in late nineteenth century England as a scientific instrument maker and optician. A brief biographical sketch is presented, along with a discussion of his 1883 book How to Use our Eyes, and How to Preserve Them by the Use of Spectacles.

Key words: *John Browning, history of optometry, optometry books.*

John Browning (1835-1925) was a noted English optician and scientific instrument maker, following in the occupational footsteps of his father and grandfather. He was apprenticed to his father at 15 years of age. During the three years of his apprenticeship, he worked for his father every other day. On alternate days he studied chemistry and physics at the Royal College of Chemistry.[1]

Browning became well-known as a maker of scientific instruments. He introduced new developments in spectroscopes, telescopes, microscopes, and meteorological instruments.[1] He made various pieces of equipment for many renown scientists, including George Biddell Airy, Faraday, Charles Lyell, and John Herschel.[1] Browning was a Fellow of the Microscopical Society of London, a Fellow of the Metereological Society, and a Fellow of the Royal Astronomical Society.

In 1867, Browning published a book entitled *A Plea for Reflectors*, which emphasized the advantages of reflecting telescopes.[2] According to the WorldCat online library catalog, there were at least four later editions of the work, in 1968, 1870, 1872, and 1876.[3] According to one biography, Browning had a special interest in spectroscopes and was the leading English maker.[2] His book, *How to Work with the Spectroscope*, was first published in 1878, and also went through several editions.

Browning set up a telephone system in Buckingham Palace and Windsor Castle.[1] He is also said to have been working on a phonograph system using metal foil when Edison hit upon the idea of using a wax cylinder.[2] Browning was described by a former associate as being "kind and considerate" to the people who worked for him.[2] He was also described as enjoying scientific work more than business.[2] He liked astronomy and some of his observations were published in the *Monthly Notices of the Royal Astronomical Society.*

A significant part of Browning's business was the making and fitting of spectacles. He saw patients from all over the United Kingdom, as well as North America, Egypt, and India.[4] He was successfully prescribing cylinder lenses in the 1870s, and he was one of the early enthusiasts for the use of the retinoscope.[4] He was the first president of the British Optical Association when it was founded in 1895, and he served in that position for five years.[4]

Browning's Book *How to Use our Eyes*

In 1883, Browning published a book entitled *How to Use our Eyes, and How to Preserve Them by the Use of Spectacles*. It went through a number of editions, extending to at least 1896.[3] I examined a reprint of the first edition of 1883, produced as part of the Legacy Reprint Series of Kessinger Publishing.[5] On the title page Browning is identified as "F.R.A.S., F.R.M.S., Etc." and "Optician to Her Majesty's Government, the Royal Society, the Royal Observatories of Greenwich and Edinburgh, and the Observatories of Kew, Cambridge, Durham, Utrecht, Melbourne, etc., etc." The title page also notes that the book contains 37 illustrations.

On the first page of the text, Browning makes the observation that it is necessary to learn how to see: "It might at first thought appear that it cannot be necessary for any person to learn to see. A moment's consideration will show that this is a mistake. Before an artist can draw any object well, he must be able to see the most delicate lights and shades upon its surface." (page 9) On pages 10 and 11, he notes that his purpose in this book is mainly to present a "popular account" of improvements in spectacles and their application. He then proceeds over the next pages to explain the rudiments of ocular anatomy and color vision.

On page 22, he explains how to read by lamp light: "Always turn your back to the source of light when you are reading, so that the light may fall on to the book, instead of coming into your eyes." A few pages later, he says that myopia is often produced by reading in "imperfect light."

Browning recognized that different lenses could be prescribed for different visual tasks: "Different spectacles should, as a rule, always be worn for playing music from those used for reading, because the music is placed on the instrument at a greater distance from the player than the book is held while reading." (page 33) He also noted that the optical centers of lenses should be over the patient's pupils: "No attention is generally paid to a pair of spectacles fitting the face, yet, to obtain the full benefit from them, they ought to fit the wearer's face so well that the centres of the glasses come exactly opposite to the pupils of the eyes." (page 34) Browning emphasized that there should be no conscious or unconscious strain from the use of spectacles. On pages 44 to 50, Browning described presbyopia and myopia.

Next Browning talked about his opinion of the importance of his work prescribing spectacles: "More than one of my valued scientific correspondents have gently hinted their regret at my devoting so much of my time to the adaptation of spectacles. They would prefer that I should direct my attention to improving still further the construction of

the spectroscope, the microscope, or the astronomical telescope. I believe I am more usefully employed in a practical application of science to the benefit of humanity, and I know that some of my medical friends support me in this opinion." (page 51) As an example, he described his successful solution in what we would think of today as a low vision case.

On pages 53 to 55, Browning discussed astigmatism, including testing for and correcting astigmatism: Cylinder lenses "have to be put into trial frames with round eyes, in which the glasses will turn easily. The wearer should then close one eye, or cover it with the hand, and slowly and carefully turn the glass round while looking at the figures on a clock-dial, and the glass should be left in the position in which the figures are seen with equal clearness all round the dial. The other glass should then be adjusted in the same way. The optician should carefully note the direction of the axes of the cylindrical lenses, and should cut them into an oval form and fit them up in oval frames." (pages 54-55)

Browning next turns to anisometropia, which he calls "unequal vison." He has this to say: "By unequal vision I mean a person having two eyes which differ in focus. The optometer is the only good test for this inequality, which is much more common than is generally supposed. When the difference in focus is very great, as a rule spectacles which equalize the focus cannot be worn; the strain upon the eyes appears to be too great. But, if a pair of spectacles to be worn at first in which the lenses differ only slightly in focus, and the difference in focus is then slowly increased, the eyes may after a time become accustomed to the difference, and in this manner both may be suited and clearer vision with comfort obtained." (page 60)

On pages 63 to 65, Browning warns that harm may come from wearing inaccurate spectacles that are "manufactured by grosses to supply the wholesale market" and that are "sold by people that are not opticians." From page 66 to the close of the book on page 72, Browning gives advice on topics such as the how to put spectacles on, how to care for spectacles, and cautions against trying to hold lenses by hand in front of the eyes while reading.

On pages 69 and 70, he advises against the use of monocles: " Wearing a single eyeglass has happily of late become less common than it used to be, but it should be confined to those who are blind in one eye. I need say nothing respecting the unpleasant expression given to the face caused by the contortion of the features, which is made to keep the eyeglass in position. This is a small evil compared to the injury done to the eyesight by working one eye at the expense of the other. Those who wear a single eyeglass soon acquire a habit of seeing with the eye only on which it is worn. The vision of the other eye is suppressed; that is, the image which is formed on the retina remains unseen, a convincing proof that people do not see with their eyes, but with their brains."

After page 72, there are six unnumbered pages of promotional material for Browning's business. The first two of these pages contain testimonials from satisfied

patients. That is followed by a two page price list of spectacles and then two pages of advertisements for binoculars.

References

1. Mr. John Browning, F.R.A.S., F.R.M.S., P.B.O.A. Dioptric Ophthalmometric Rev 1897;8:122-126.

2. John Browning. Monthly Notices Roy Astronom Soc 1930;40:359-362.

3. WorldCat. http://newfirstsearch.oclc.org.

4. The British Optical Association: its founders and formation. Dioptric News Br J Physiol Opt 1945;5:1-18.

5. www.kessinger.net.

Contributions to Optometry by Albert Fitch

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It is my opinion that the manner in which optometry is practiced at the present time (2009) in the United States, should be attributed more to the pioneer, Albert Fitch (1879-1960), than to any of the many distinguished leaders of our profession since 1898. Fitch was born in Philadelphia and lived and worked there his entire life. He started learning optometry in 1902 through an apprenticeship arrangement, and in 1906, he established his own practice.[1] When he died in early 1960 at the age of 80, he left behind a legacy of leadership and service. Following are some of his contributions.

As early as 1914, Albert Fitch was the leader of an organization that was formed and called the Pennsylvania College of Optometrists. Several years later, as the result of the activities of this group with Albert Fitch as Chairman of the Board of Directors (on March 30, 1917), the Pennsylvania Optometry Bill was passed and signed by the Governor to establish a non-profit college of optometry, initially known as Pennsylvania State College of Optometry (PSCO) and later as the Pennsylvania College of Optometry (PCO).

Fitch faced strong opposition in establishing educational standards considered impossible in the proprietary schools then in existence. Fitch recalled later in his professional autobiography that his "idea of a proper College of Optometry was that it must compare with any of the colleges of the other health professions, such as Medicine and Dentistry, and be on a par with the best of them."[2] Fitch viewed expansion of the responsibilities of optometrists as desirable and recognized that it could be achieved only with high quality of instruction and clinical experience in optometry schools.

One of the key architects of the profession, Irvin M. Borish, had this to say about Albert Fitch. "From the start, Albert Fitch had more vision than anyone else in the other independent institutions. Fitch was one of the first to expand the biological sciences. He had anatomical dissections way, way back in the old Pennsylvania State College. So, in many ways, he was a visionary of his time."

From the 1970's on, the Pennsylvania College of Optometry played the key role in expanding the profession's role in health care in two important ways. One, it provided the education and clinical training in the use of diagnostic and therapeutic agents throughout the country along with expert testimony from faculty at legislative hearings. For a significant period of time it was the sole optometric college offering this service. As many as 17 of the first 20 states to enact diagnostic pharmaceutical agent legislation used expert testimony and educational instruction from PCO faculty.[3] Two, graduates of PCO became the leaders in the movement to expand optometry's role in health care.

Albert Fitch is recognized as the founder of PCO and served as its President for 40 years (1919-1959).

As early as the 1920's, Fitch lectured on the subject of Office Practice. He stressed the importance of the professional appearance and location of the optometrist's office. Through his influence and that of the American Academy of Optometry (whose major contribution over many years was the professionalization of optometry), many improvements in the appearance and location of offices were realized.

In 1923, Fitch caused a bill to be introduced in the Pennsylvania Legislature empowering PSCO to confer the doctorate degree upon its graduates. It was passed by both houses and signed by the Governor in April of that year. A first for optometry!

It was Albert Fitch who led the educational community increasing the years of study required to become an optometrist (to 3 years in 1923, 4 years in 1935, 5 years in 1949 – and on to 6 years, 7 years, etc.). In addition, his integration of the biological sciences into the curriculum has stood the test of time and is now standard in today's optometric educational programs.

Optometry's first law in the United States authorizing the use of diagnostic pharmaceuticals was passed in the state of Rhode Island in 1971. The first law authorizing the use of therapeutic pharmaceuticals by optometrists was enacted in North Carolina in 1976. Decades before those laws, Fitch caused the introduction of a bill (#1119) in the Pennsylvania Legislature extending the practice of Optometry to the whole field of eye care (meaning no restrictions). The year – 1937! The bill had support in some circles of the state government, but it failed to pass.

For a period of 18 years (1922-1940), Albert Fitch served as Secretary – Treasurer of the American Association of Schools and Colleges of Optometry. Under his leadership, this group became the Association of Schools and Colleges of Optometry (ASCO) where he became its first president, serving from 1941 to 1945.

On a personal level, my relationship with Albert Fitch was an adversarial one. First of all, when I was a student he denied my request for the formation of a student council because he felt it was unnecessary. Later when I was a member of the College's Board of Trustees, he refused to share financial information concerning the College with me. I saw his style as autocratic, but later I came to see how such a style was advantageous for the founding and nurturing of an optometry college. And I have come to admire Fitch for the role played by him and the educational institution he founded in advancing professional optometry.

The professionalization of Optometry required a strong and expanding educational base, the conferring of an appropriate degree, successful legislation, and acceptance by the public, producing national results. Not only was Albert Fitch

successfully involved in all of these pursuits, but the mark he left on many current leaders of the profession continues to this day.

References

1. Obituaries. J Am Optom Assoc 1960;31:659.

2. Fitch A. My Fifty Years in Optometry. Philadelphia: Pennsylvania State College of Optometry, 1955;1:81-82.

3. Wolfberg MD. A profession's commitment to increased public service: optometry's remarkable story. J Am Optom Assoc 1999;70:145-170.

Book Review: Adams of Fleet Street, Instrument Makers to King George III

Adams of Fleet Street, Instrument Makers to King George III. John R. Millburn. Aldershot, England: Ashgate, 2000. xix + 420 pages. ISBN 0-7546-0080-7. Hardcover, $140.

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George Adams Senior (1709-1772), George Adams Junior (1750-1795), and Dudley Adams (1762-1830) were noted instrument makers in London. Among the wares they sold were optical instruments and spectacles. They were also authors, with George Adams Junior publishing a book entitled *An Essay on Vision, Briefly Explaining the Fabric of the Eye, and the Nature of Vision*, in 1789.

The text of *Adams of Fleet Street* is divided into three parts, each emphasizing one of the three previously mentioned members of the Adams family: Part I (chapters 1-5, pages 3-156) on George Adams Senior; Part II (chapters 6-9, pages 159-269) on George Adams Junior; and Part II (chapters 10-12, pages 273-331) on Dudley Adams. The book covers family lineages, their work in business, their guild activities, their royal business connections, the instruments they made, and their publications.

George Adams Senior served an apprenticeship from 1724 to 1733. In 1734, he established his instrument business. The book contains numerous black and white photographs and drawings of instruments made by the Adams family, including orreries (a mechanical model of the solar system, showing orbits of the planets and their moons), microscopes, surveying instruments, quadrants, dials, sets of geometrical solids, sundials, draftsmen's tools, mechanical tables, air pumps, globes, calipers, barometers, compasses, perambulators, thermometers, telescopes, and theodolites (a surveying instrument with rotating telescopic sight to measure horizontal and vertical angles). There are more pictures of microscopes and globes in the book than of any other instrument. There are reproductions of some title pages and figures from their books and illustrations of buildings at or near their places of business. The book also contains two Adams genealogy charts and several tables summarizing various aspects of instrument sales, publications, etc.

George Adams Senior was successful in attaining various appointments. Most of these appointments were continued by his sons. He was Mathematical Instrument Maker to his Majesty's Office of Ordnance, from 1748 to his death in 1772; Mathematical Instrument Maker to the Royal Mathematical School, from 1748 and continued by George Adams Junior and by Hannah Adams (George Junior's widow) to 1796; Mathematical Instrument Maker to his Royal Highness George, Prince of Wales, from 1757 to 1760; and Mathematical Instrument Maker to his Majesty George III, from

1760 and continued by George Adams Junior and by Dudley Adams to 1817. George Adams Junior did not have a specific appointment to the Office of Ordnance, but was one of the regular suppliers from 1780 to 1795. George Junior was Optician to his Royal Highness George, Prince of Wales from 1787 to 1795. Dudley Adams was Globe Maker to his Majesty George III, from 1794 to 1817; Mathematical Instrument Maker to the Office of Ordnance, 1795 to 1806; and Optician to their Royal Highnesses the Prince of Wales and the Duke of York, from 1796 to 1817.

George Adams Senior published a number of books on scientific topics. They included (with dates indicating the original and succeeding editions, some of the latter being mainly reprintings after the author's death): *Micrographia Illustrata* (1746, 1747, 1771), *The Description and Use of a New Sea Quadrant* (1748), *The Description and Use of the Universal Trigonometrical Octant* (1753), *Instructions for the Use of Hadley's Quadrant* (c. 1757), *A Treatise Describing and Explaining the Construction and Use of New Celestial and Terrestrial Globes* (1766, 1769, 1772, 1777, 1782, 1810).

George Adams Junior was born in 1750 to his father's second wife and was apprenticed to his father in 1765. When his father died in 1772, George Adams Junior was 22 years old and had completed the required seven years of his apprenticeship but had not yet petitioned for Freeman status. His petition was accepted in February, 1773, and in about December, 1773, he took over his father's business, after a period of time as "Adams, Widow and Son."

A significant portion of George Adams Junior's income derived from sales to the Office of Ordnance. With the end of the American War of Independence, that source of income declined sharply. Looking for an additional line of business, he turned to writing and selling science books. His first book was *An Essay on Electricity*, which appeared in 1784, with subsequent editions published in 1785, 1787, 1792, and 1799. His *Essays on the Microscope* was published in 1787 with a second edition in 1798.

George Adams Junior's fourth title was *An Essay on Vision*, published in 1789, with a second edition in 1792. It also appeared in Dutch and German translations. The author states that "it seems that Adams wrote it primarily because many people were using spectacles who did not really need them. By giving 'proper rules for ascertaining when spectacles are necessary, and how to choose them without injuring the sight' (part of the subtitle), no doubt he hoped to dissociate himself from pedlars and hawkers who sold unsuitable glasses with little regard for the harm they might do." (pages 224-225)

Other titles published by George Adams Junior were: *Astronomical and Geographical Essays* (1789, 1790, 1795, 1799, 1803, 1812), *Description, Use, and Method of Adjusting Hadley's Quadrant and Sextant* (1789), *A Short Dissertation on the Barometer, Thermometer, and Other Meteorological Instruments* (1790), *Geometrical and Graphical Essays* (1791), and *Lectures on Natural and Experimental Philosophy* (five volumes, 1794).

George Adams Junior died in 1795, at the age of 45. Dudley Adams, who was born in 1762, started an apprenticeship with his older brother in 1777. He continued to work for his brother for some time after completing the apprenticeship, and later started his own globe and instrument making business. After 1800, it appears that Dudley may have begun to neglect his business and live beyond his means, so that he was declared bankrupt in 1817. He lived to 1830, but may have had some mental deterioration late in his life.

George Adams Senior had one patent, George Junior none, and Dudley three. One of Dudley's patents, dated 1797, was for a type of spectacles. Lenses were suspended from a headband. The separation of the lenses could be adjusted and the lenses could be rotated up out of the way when they weren't needed. The headband was hinged so that it could be folded up. The book contains a photograph of a recent reconstruction of these spectacles.

The endmatter of the book takes up almost ninety pages: Notes, pages 333-361; Appendix I, George Adams Senior's Catalogue 1775, pages 362-366; Appendix II, George Adams Junior's Last Catalogue 1795, pages 367-382; Appendix III, Aids to Dating Adams Instruments and Publications, pages 383-385; Appendix IV, Short-Title List of Publications by the Adams Family, pages 386-398; Bibliography, pages 399-405; and Index, pages 407-420.

George Adams Senior's catalog in Appendix I is divided into mathematical instruments, optical instruments, and philosophical instruments. Among the optical instruments are telescopes, microscopes, camera obscuras, mirrors, prisms, opera glasses, reading glasses, spectacles for the nose, spectacles for the temples, double joint spectacles, and spectacles of Brazil pebbles. One of a number of headings in George Junior's catalog was optical instruments. It included spectacles of several types, reading glasses, opera glasses, telescopes, microscopes, magnifying glasses, camera obscuras, an artificial eye for illustrating the principles for vision, prisms, and mirrors.

This book was extensively researched and represents definitive biographical studies of the Adams family of English instrument makers. It is recommended to anyone who wants to learn more about them.

Book Review: Aladdin's Lamp: How Greek Science Came to Europe Through the Islamic World

Aladdin's Lamp: How Greek Science Came to Europe Through the Islamic World. John Freely. New York: Alfred A. Knopf, 2009. xi + 303 pages. ISBN 978-0-307-26534-0. Hardcover, $27.95.

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This book illuminates important persons in the path from the origination of ancient Greek science, to its translation and advancement in the Middle East, to its rediscovery in Europe, forming part of the foundation for the Renaissance and the Scientific Revolution. The cast of characters extends in time from Thales and Anaximander in the 6th century Greek world to Isaac Newton (1642-1727). Roughly equal numbers of chapters are devoted to ancient Greek Science, Middle Eastern science, and the emergence of European science.

A frequent topic in the book is a heliocentric model of the solar system, dating back to Aristarchus of Samos (ca. 310-ca. 230 B.C.), but various topics in optics also receive significant emphasis. Empedocles (ca. 482-ca. 432 B.C.) believed that light travels through space at very great speed. The equal angles of incidence and reflection, recorded in Ptolemy's (ca. 100-ca. 170 A.D.) *Optics*, was known to Euclid. Middle Eastern scientists who did significant work in optics included al-Kindi (ca. 801-866), Hunayn (Jannitus) (808-873), Ibn Sina (Avicenna) (980-1037), Alhazen (ca. 965-ca. 1041), and Ibn Rushd (Averroes) (1126-1198).

The author credits Gerard of Cremona (1114-1187) as being the most prolific translator of Arabic to Latin, some 71 works, including Arabic versions of the ancient Greek scientists and writings of Middle Eastern scientists. Gerard translated works from many fields, including optics. The author devotes significant attention to European optics, including the writings of Robert Grosseteste, Roger Bacon, Witelo, Dietrich of Freiburg, Kepler, Descartes, and Newton.

This book provides a chronology of books, scientists, and translations that ranges widely across time and distance. It provides a view of the preservation, transmission, and advancement of knowledge. The book includes 28 pages of reference notes and bibliographical references, as well as a 15 page index. There are approximately 28 black and white illustrations scattered throughout the book. The author John Freely has taught physics and history of science and has published more than forty books.