

HINDSIGHT

Journal of Optometry History

October, 2013

Volume 44, Number 4

Official Publication of the Optometric Historical Society

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(Incorporated)

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South Bend, Indiana.

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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.

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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).

Use of the current title, Hindsight: Journal of Optometry History, began in 2007 with volume 38, number 1.

On the cover: An 1899 advertisement from The Optical Journal for the South Bend College of Optics, of South Bend, Indiana. The term optometry was not in common use at that time. What we would today call optometry was often then referred to as optics. An article starting on page 71 discusses optometric education around the beginning of the twentieth century.

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TABLE OF CONTENTS

The Genesis of the Optometry Training Program in the Birmingham Veterans Affairs Hospital, <i>John F. Amos</i>	50
Notes on Optometric Education Around the Beginning of the Twentieth Century, <i>David A. Goss</i>	71
“Optometrist of the Stars”: His Wife Remembers, <i>Les-Lee Roland</i>	77
William Kitchiner (1775-1827), Author of <i>The Economy of the Eyes</i> , <i>David A. Goss</i> ...79	
Robert Klark Graham (1906-1997), <i>Jack Runninger and Richard L. Hopping</i>	82
Book Review: <i>A Short Bright Flash: Augustin Fresnel and the Birth of the Modern Lighthouse</i> , <i>Reviewed by David A. Goss</i>	89
Instructions to Authors.....	91
OHS Membership Application.....	92

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The Genesis of the Optometry Training Program in the Birmingham Veterans Affairs Hospital

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Introduction

As the University of Alabama at Birmingham School of Optometry (UABSO) celebrates its 44th year, it is important to record the history of events that served to not only shape the UABSO, but of equal importance, have significantly impacted the profession as well. During the first 25 years of the UABSO professional program's history, fourth year interns participated in four affiliated programs. These programs were the Vision Function Laboratory of the Center for Developmental and Learning Disorders (CDLD), the Optometry Clinic in the Diabetes Research and Education Hospital (DREH), the vision screening and low vision rehabilitative care provided to clients of the Alabama Institute for the Deaf and Blind (AIDB) and the Optometry Service of the Birmingham Veterans Administration Hospital (BVAH). The CDLC, DREH and BVAH were all located on the UAB campus, with the AIDB facility being located about 50 miles east of Birmingham in Talladega, Alabama. The first three of these rotations began in 1972 and were staffed with fourth year interns under faculty supervision. Of the four original rotations, all but the Optometry Clinic in the DREH, continue to exist and provide, in some form, patient care services. The DREH clinic eventually became a victim of political infighting in which ophthalmology, originally resistant to providing services in the DREH, agreed to provide such services either at the Diabetes Hospital or the Eye Foundation Hospital, which was located one block away. Eventually the DREH ceased to exist as an entity when treatment, education and research of diabetes and other endocrine diseases were integrated into the UAB Health System. However, it is the optometry training program in the BVAH that has had the greatest impact on the profession, especially from the national perspective.

Early History of Optometry in the VA System

Newcomb, in his paper on the history of optometry in the Veterans Administration (VA), provides a brief history related to the origins of the professions existence in the VA System.¹ Optometrists were first placed on the staff of VA hospitals in 1947 following the end of World War II. However, it was not until 1957 that Public Law 85-96 provided specific authority, through United States Code (38 USC) for subsequent employment of additional optometrists. In 1958, Public Law 85-462 amended section 4105 (5) of USC 38 to require that all optometrists employed by the VA must hold valid state licenses to practice optometry and must have graduated from an accredited and approved United States school or college of optometry. Next, several laws were enacted to clarify the fact that staff optometrists were duly authorized to render care to eligible veterans for "medical services". In 1958, Public Law 85-857, and later in 1960, Public Law 86-598, made further modifications to USC 38 such that services of staff optometrists were

defined under the rubric of “medical services”. The purpose of these laws was to enhance the VA’s ability to render optometric care to eligible veterans. Although veterans had been receiving limited optometric care since 1947, the U.S. Congress believed it was necessary to emphasize and clarify the fact that staff optometrists were duly authorized to render care to eligible veterans. In this manner, the optometrists could not be excluded from providing such services, even though optometrists were not specifically included in the original law.

With the establishment of the UAB School of Optometry, as an integral part of an academic health center, the profession’s involvement in the care of veterans was poised to expand. The approval of an academic affiliation between UABSO and the Birmingham VAH and the establishment of an optometry program in the Birmingham VAH served as a stimulus for the development of other optometry programs in VA facilities with academic affiliations.

Appointment of Dr. Peters to the Dean’s Committee of the Birmingham VAH

The UAB School of Optometry began its first program, the professional program (Doctor of Optometry), on September 1, 1969. The School’s first Dean was Dr. Henry B. Peters. Dr. Peters was the only faculty member for the first academic year (1969-70). In the first UABSO Annual Report, which covered the 1970-71 year, Dr. Peters discussed future plans for the School.² In this Annual Report, Dean Peters discussed a possible relationship with the Veterans Administration and more specifically with the BVAH. As the Dean of a new health care professional program on the UAB campus, Dr. Peters had been offered, and accepted an appointment during this year, as a member of the Dean’s Committee of the BVAH. The appointment was made by Dr. M. J. Musser, Chief Medical Director, Department of Medicine and Surgery, Veteran’s Administration Central Office (VACO), on the recommendation of Dr. Clifton Meador, Dean of the University of Alabama, School of Medicine, at UAB.²

The transformation of the VA into its present system actually began in 1946 with the establishment of an appointed VA Administrator, a Chief Medical Director, and a Department of Medicine and Surgery along with a VA Central Office and the removal of physicians and dentists from Title V-Civil Service for purposes of pay. The first training program in optometry was approved in 1972 and the position Director of Optometry was made possible by P. L. 93-82.^{1,3} An in depth history of the evolution of the Veterans Administration, the Department of Veterans Affairs and the role of optometry within the VA has been provided by Myers.³

Planning and Initiation of an Optometry Training Program in the Birmingham VAH

It is apparent that Dr. Peters had entered into discussions with the Veterans Administration during the academic year of 1970-71, for the development of a pilot optometry program.² The purpose of this program was to provide clinical training for optometry interns from the UABSO and optometric technicians from the Regional Technical Institute (RTI). These programs were to be located in the BVAH. A proposal was developed by the UABSO and the BVAH for submission to the Veterans Administration Central Office (VACO) as a result of discussions between Dean Peters,

the Director of the BVAH, and representatives of the Research and Education Service in the VACO during the summer of 1971. This proposal was submitted on October 18, 1971 and included a request for funding of renovation to existing space in the BVAH, purchase of equipment and support for faculty and staff as well as stipends for optometric technician students.⁴ Supplemental information was submitted to the VACO on December 22, 1971 that provided more detailed financial information. On February 2, 1972 the Director of the Birmingham VAH was notified of the approval for affiliation between the Birmingham VAH and the UAB School of Optometry and the funding of a pilot program.^{4,5}

Dr. Peters received a copy of the Chief Medical Director's *Weekly Highlights Reports* on March 7, 1972 from Mr. Russell D. Bowman, Coordinator of Scientific Communications, entitled "**Birmingham VAH to Help Train Optometrists and Optometric Technicians**".⁶ This *Highlight Report* noted that this would be the first program in the VA System to provide clinical training for optometrists and optometric technicians. This program was the result of an affiliation between the School of Optometry, the University of Alabama in Birmingham Medical Center and the Birmingham VAH. This report also referred to the fact that to become a completely effective member of a medical care team, optometrists needed more inter-professional interaction during their training. It was also envisioned that this program would help fill the need for the workforce required to provide comprehensive care to the veteran. It is clear from this *Highlights Report* that Dr. Peters recognized the considerable long-term promise such a program would have for teaching, research and patient care related to the UABSO and the profession of optometry.

The appointment of Dean Peters to the BVAH Dean's committee and the relationship that followed set in motion certain actions that led to a more formal relationship. In a letter to Dr. Musser, dated March 31, 1972, Dr. Peters refers to Dr. Musser's visit to Birmingham and Musser's announcement of the affiliation of the BVAH and the UABSO.⁷ The date of Dr. Musser's visit is not specifically mentioned by Dr. Peters, but it seems likely this visit occurred shortly before or perhaps within the same week, as the letter to Dr. Musser.

In fact, on February 2, 1972, the Veteran's Administration Department of Education and Research had formally approved and funded a program for the clinical training of optometry students and optometric technician students in the BVAH.⁵ The implementation of this new program was greatly assisted by the previous establishment of innovative training programs by the BVAH and the University of Alabama in Birmingham Medical Center. The affiliation of the UABSO and the BVAH brought to 32 the number of categories of health care personnel training in cooperative programs in an effort to help alleviate the shortage of health manpower.⁴ This pilot program was also mentioned by Senator Alan Cranston in an address before the Western States Optometric Conference on March 2, 1972 and is explained in more detail in Appendix II of this paper.

On November 22, 1972, Mr. Clyde G. Cox, Director of the BVAH, issued Hospital Memorandum Medical Administration 45(136) as related to Policies and Procedures for Patient Services in the Optometry Program. This memorandum contained a stated Purpose, Optometric Services to Be Provided to Eligible Veterans, Policy for Eligible Outpatient and Inpatient Veterans, Procedures for Eligible Outpatient and Inpatient Veterans and Procurement of Prosthetic Services and References to Applicable VA Regulations.⁸

A position description was signed by Dr. Jeffery T. Keller as Chief, Optometry Service; Mr. Clyde G. Cox, Director of the BVAH; Mr. E. Vaughn Crawford, Administrative Officer/Medical Executive Board; and Mr. R.K. Davenport, Personnel Management Specialist, on December 12, 1972. The position description related to the Chief, Optometry Service at BVAH as regards Principle Duties and Responsibilities, Supervisory Controls over the Position and Other Significant Facts.⁹ Dr. Keller initially received approximately one-half of his salary from the UABSO and the remainder from the BVAH.

On December 21, 1972, Dean Peters sent a memo to the Association of Schools and Colleges (ASCO) and its Board of Directors announcing the opening of the Optometry Clinic in the BVAH.¹⁰ He included the Memorandum Outlining Policies and Procedures along with reference to this memorandum being the first known statement in the VA covering optometry services for a training program. The clinic was completed in December 1972, and Keller stated that the BVAH Optometry Service officially began January, 1973.⁴

Dr. Peters also prevailed on Ms. Gloria Goldstein, Director of Public Affairs at UAB during this time, to write U.S. Representative John Buchanan (R-AL) requesting that he have an announcement of this affiliation inserted in the Congressional Record. Goldstein enclosed two articles containing the necessary information; one being a statement or article written specifically for the Congressional Record, and the other, a news release sent to the press by her office.¹¹ This letter, written March 31, 1972, also referenced the fact that Dr. Musser was in Birmingham that week and both he and Dr. Peters thought the insertion of this information in the Congressional Record would be helpful.

On July 24, 1973 Mr. Clyde Cox, the Hospital Director of the Birmingham, VAH, sent a letter to the Regional Medical Director at VACO. In this letter he describes the organizational change at the Birmingham VAH in which the position Chief-of-Staff had been restored in lieu of the Medical Executive Board. This organizational change had recommended that optometry be placed under the Assistant Director with support and allied health services. The organizational chart was approved by VACO on June 4, 1973. With the establishment of the position Chief-of-Staff and implementation of the approved organization, Mr. Cox states that his office has received a request that optometry organizationally be placed under the Chief-of-Staff. The primary justification for this request stems from the feeling of this new VA Service to identify with and report to the Chief-of-Staff. The Chief-of-Staff concurred. Cox requested that the Optometric

Service be relocated accordingly.¹² Interestingly, on August 16, 1973, Dr. R. N. Whittington, Regional Medical Director of Region 2, wrote a letter to the Director of the VAH, Birmingham advising him that the organizational chart had been revised and optometry had organizationally been placed under the Chief-of-Staff.¹³ This issue would be revisited again in several years.

In an August 2, 1973 memorandum to UABSO faculty Dr. Jeffrey Keller, Director of Optometry Services at the Birmingham VAH, announced that President Nixon had signed the Veteran's Health Care Expansion Act of 1973. This Act established the position of Director of Optometry and greatly expanded the availability and eligibility of veterans and their families for outpatient services.¹⁴ However, as of August 28, 1973, the regulations, as they were being redrafted, had not been published by the VA.¹⁵ On October 19, 1973 Dr. Peters responded to a request from Dr. Paul Haber, Deputy Assistant Chief Medical Director, Professional Services, VACO. In this response Dr. Peters discusses, based on the development of the optometry program in the Birmingham VAH, the significant need for optometric services in the VA, concerns regarding the reporting structure for the optometry service and the need for optometry to report to the Chief-of-Staff and not surgical Services, services performed by optometry and the job description for the Chief of Optometry Services at VAH Birmingham, the willingness of UABSO to serve as an intake, indoctrination, qualification and continuing education center for optometrists employed by the VA, future development of Optometry Services and estimated costs for an optometry clinic based on Birmingham VAH, and finally the job description for the Director of Optometry Service.¹⁶

On November 1, 1973 Dr. James Gill wrote to Dr. Peters requesting his assistance in the structuring of a Functional Statement for Optometry for use in the VA. Dr. Gill served on an American Optometric Association (AOA) Committee which met with the VA among other federal agencies. In this letter he mentions a recent meeting he attended in Dallas, Texas with Drs. Peters, Robert Day and Mr. Hal Bailey.¹⁷ There is a copy of a four item list regarding a functional statement for optometry in Dr. Peters' file but what role he played in its development is not stated.

Optometry/Ophthalmology Relations in the BVAH

Dr. Ralph Levene, Chairman of the Combined Program in Ophthalmology at UAB, sent a memorandum dated November 23, 1973 to Drs. Hill, Pittman, Peters and Aldrete. In this memorandum he proposed a schematic outline of an ophthalmology-optometry program for the VA. He asked that Dr. Peters study the proposal and comment. In summary, he proposed that 1.) The final program between the two professions involves the proposed Blind Rehabilitation Center (BRC), 2.) The proposal was in two steps because of the time lag in building a BRC; 2a.) Step 1 consists of an immediate updating of ophthalmology concurrent with the appropriation of funds from Washington to the Birmingham VA in 1974. This involved space, money and an independent service, 2b.) Step 2 a detailed joint proposal for optometry and ophthalmology for a BRC program and the incorporation of adjacent space for the two professions within an expanded BRC, 3.) At this time Levene thought it best to keep the ophthalmology service within the Medical-Surgical unit rather than leave this unit and

form a new Visual Science Unit with optometry. At some future time this idea could be re-evaluated.¹⁸

The discussion then broadened to the issue of ophthalmologists teaching optometrists and the conditions that must exist for this to occur. Among these conditions set forth by Dr. Levene were that the ophthalmology community would teach optometrists to *detect* ocular disease but any proposal of unilateral legislation by optometry, deemed unacceptable to ophthalmology, would result in such teaching to cease immediately.¹⁹ Dr. Peters initial response to this memorandum was to send a memorandum to the Curriculum Committee, Department of Optometry, and Dr. Boyd Eskridge, Chairman, Department of Optometry. In this memorandum Dr. Peters addressed the memorandum from Dr. Levene and his subsequent meeting with Levene. He stated he could make no promises regarding the actions of the Alabama Optometric Association or the Alabama Board of Optometry. He did seek the Curriculum Committee's input related to an outline of material that could be taught, the number of lecture hours and other details of ophthalmology's participation in the professional program of the UABSO.²⁰ This discussion had evolved beyond the scope of the optometry program at the Birmingham VAH and is discussed in greater detail in Appendix I.

On February 28, 1974 Dr. Peters wrote a memorandum to Dr. William Baldwin, President of ASCO, in which he proposed ASCO develop a position paper to address the same general problem areas of optometry/ophthalmology relations.²¹ This memorandum was presumably written in response to the AUPO position paper which is discussed later in this paper. The call for a position paper was also renewed later by Dr. Kenneth Myers in May, 1976. Dr. Myers was the first Director of Optometry Service in the VA Central Office.

Efforts to Establish a Joint Blind Rehabilitation Center

On May 9, 1975 Dr. Peters wrote a letter to Dr. Carlton C. Evans, Director of Health Services Research and Development Service at VACO. Dr. Peters expressed an interest in, and had learned from Dr. Myers, of Dr. Evans interest in the potential of developing a research proposal for exploring role relations between optometry and ophthalmology in a joint clinical program.²² He enclosed a "letter of intent" drafted at UAB in December, 1974. In the "Statement on Development of a Joint Eye Clinic Veterans Administration Hospital" Dr. Peters submitted to Dr. Evans, he references Dr. Harold Skalka as the Chairman of the Department of Ophthalmology. This statement proposed that a Blind Rehabilitation Center (BRC) be developed and that one floor of this addition be designated as a joint optometry/ophthalmology clinic.

On June 25, 1975 Dr. Peters sent a memo to Dr. Skalka informing him that 1.) The Special Project Grant for faculty exchange had been verbally approved for funding and each program may proceed to recruit for one faculty position and 2.) Dr. Evans had sent a letter encouraging the submission of a proposal to explore role relationships between ophthalmology and optometry in the Birmingham VAH.²³ In a memorandum dated July 14, 1975, Dr. Peters notified Dr. Myers as to the status of the District Council

on Eye Care. Dr. Peters had proposed such a council be formed to develop referral and service procedures related to eye care at the six VA Hospitals in Alabama. These six hospitals comprised the VA's Medical District 11.²⁴ Dr. Peters had received a number of positive responses to the proposal and it was approved on July 2, 1975 by Dr. S Richardson Hill, Vice President for Health Affairs, UAB. On August 21, 1975 Dr. Peters delivered a report to the Academic Health Affairs Committee, VA Medical District 11, on "The Joint Optometry-Ophthalmology Clinic, VAH Birmingham".²⁵

Dr. Newcomb Appointed Chief of BVAH Optometry Service

In December, 1975 following the completion of the Masters of Public Health degree from UAB, Dr. Robert Newcomb was appointed Chief of the Optometry Service at the BVAH. On February 25, 1976 Dr. Robert Slaughter, Chief-of-Staff at BVAH, issued a policy for optometric services and clinical education in the VA Hospital.²⁶ In this memo he approved a list of topical ophthalmic pharmaceutical agents that could be used for diagnostic purposes. In a personal communication from April, 2010 Dr. Newcomb related that initially Dr. Slaughter had approved everything on the list with the exception of methylcellulose.²⁷ Methylcellulose was, however, on the approved list sent by Dr. Slaughter and on the Diagnostic Pharmaceutical Agents list sent to the Chief-of-Pharmacy Services by Dr. Newcomb on March 3, 1976. How this list was approved is uncertain and somewhat curious considering the negative Alabama Attorney General's opinion that existed at this time and the friendship between Drs. Slaughter and Robert Morris, Chief-of-Ophthalmology at the BVAH. Perhaps it was a result of Dr. Slaughter being a Colonel in the Alabama Air National Guard at that time and, undoubtedly, being aware that military optometrists were often privileged to use both diagnostic and therapeutic ophthalmic pharmaceutical agents while on active duty. Dr. John Potter was appointed as an additional staff optometrist during 1976. Like Dr. Newcomb, Dr. Potter had been a Navy optometrist during the Vietnam era.

It is important to keep in mind that in Federal agencies such as the VA, Department of Defense (DOD) and Indian Health Service (IHS) Hospitals and Clinics, clinical privileges are not governed by state law. In these federal facilities, clinical privileges are granted to staff optometrists, just as with other independently licensed health care professionals, by a local Executive Board based on verification of credentials that include education, licensure and clinical experience as well as the needs of the facility. All federal health care professionals need to be state licensed but not necessarily by the state in which a particular federal facility is located. However, it should be noted that on November 14, 1975 the Alabama Legislature had passed a new law that did *not* prohibit the use of drugs for diagnostic purposes. It would take another six years before the issue concerning the use of drugs by optometrists for diagnostic purposes in Alabama was finally settled with a positive Attorney General's opinion.

BVAH Organizational Structure

Next, ensued several exchanges related to changing the organizational structure such that instead of being a service that reported to the Chief-of-Staff, optometry would report to the Surgical Service throughout the VA. In a letter dated May 12, 1976, Dr. R. M. Whittington, Associate Deputy Chief, Medical Director for Operations, VACO, stated

that a recent review of hospital organizations was needed. The approved organizational structure for the BVAH facility was included by attachment but questions had been raised concerning the separate service status for optometry. He concluded by stating this element of a separate optometry service was disapproved and should be restructured as a section under an appropriate service.²⁸ In most other VA facilities optometrists functioned under the supervision of the Chief of Surgical Service, as did ophthalmology, and this was consistent with Departmental policies. Thus, even though optometry was clearly not a surgical discipline, its scope of practice was more similar to ophthalmology's than any other discipline in the VA hospital and, therefore, was placed under Surgical Service for administrative parity reasons.

In a May 20, 1976 memorandum to Dr. S. Richardson Hill, Dr. Peters made an urgent appeal that the current organizational structure of direct reporting to the Chief-of-Staff be preserved.²⁹ On June 15, 1976 Dr. Whittington notified the BVAH Hospital Director that his appeal for the continuation of a separate Optometry Service had been denied.³⁰ Whittington further pointed out that Congress had created the position Director of Optometry and not an Optometry Service. The Director of Optometry in the Central Office would be assigned to VACO Surgical Service.³⁰ Ironically, Dr. Whittington had approved the original organizational change placing optometry under the Chief-of-Staff in the Birmingham VAH in 1973.¹³

From the first year of the establishment of an affiliation agreement for an optometry service between the UABSO and the Birmingham VAH in 1972, Dr. Peters envisioned a Blind Rehabilitation Center (BRC) at this hospital. By 1976 there were only three such BRC's in the U.S.: one in Palo Alto, California, one at the Hines VAH in Chicago and one at the Westhaven Hospital in Connecticut. There was no such facility in the entire Southeastern Region of the United States. The University Administration and the Birmingham VAH had collaborated in preparing a proposal and it had been under active consideration by the VACO for some four years. In an effort to gain support for this BRC project, and to increase its priority, Dr. Peters wrote a letter to Mr. W. W. Wadsworth in the State of Alabama, Department of Veterans Affairs.³¹ Dr. Peters had met Mr. Wadsworth at a recent VAH Dean's Committee meeting in Birmingham. By this time Dr. Peters had also secured the support of the Veterans of Foreign Wars and the Blind Veterans Association.

On July 29, 1976 Dr. Peters sent the following materials to Dr. W. F. Holdefer, Chief of Surgical Service at BVAH.³² First, the original proposal for the development of a clinical training program in the VAH for optometry, second, the original and renewed applications for an interdisciplinary training grant between optometry and ophthalmology, including the joint statement for the BRC and joint clinic and third, the current operating statement for the Optometry Service in the BVAH. (It is assumed that either Dr. Holdefer was new to this position or not familiar with the project).

In a Report of Contact, Mr. Doyle Liles, Hospital Director, BVAH on July 29, 1976 sent notice to Mr. Michael Homyak at VACO that confirmed the BRC, including the

ophthalmology/optometry clinic, were scheduled for design in FY 1977 and FY 1978. This facility was to be a five story addition to the Dental Wing of the BVAH.³³

In an August 12, 1976 letter to Dr. Paul Haber, Associate Chief, Medical Director for Professional Services, Department of Medicine and Surgery, VACO, Dr. Peters expressed concern about the change in reporting structure and sought Dr. Haber's support of the BRC and Joint Eye Clinic at the BVAH.³⁴ In a separate letter dated August 25, 1976, Dr. Peters again wrote Dr. Haber, expressing concern that he had learned that one of the proposals circulating around some circles was to organizationally place optometry under ophthalmology.³⁵ He urged this matter be given his personal attention and, if necessary, a meeting scheduled with optometry leaders.

As a result of this change, Dr. Newcomb was directed at some time in 1976 to send all unscheduled walk-in patients examined by optometry to ophthalmology for confirmation of diagnosis. Dr. Newcomb was diligent in complying with this directive even to the point of sending patients with straightforward refractive conditions such as presbyopia. Needless to say, after approximately six months, this resulted in even ophthalmology recognizing the waste of such redundant services and called to inform Dr. Newcomb it would not be necessary to continue these referrals.²⁷ At the request of Dean Peters, Drs. Newcomb and Potter later published two articles on diagnostic outcomes of optometric referrals within the BVAH, which demonstrated both timeliness and appropriateness of optometric management plans.^{36,37}

Important Federal Legislation

On October 5, 1976, Dr. Peters wrote a memorandum to the faculty of the School of Optometry announcing passage by the U. S. Congress of two bills of interest to optometry. The first being the Veteran's Omnibus Bill which established a separate Optometry Service in VA Central Office under Title 38.³⁸ This separate service removed the threat of ophthalmological domination of optometry in the VACO, but not at the local level, and also provided for improved compensation for staff optometrists. The second bill was the Health Manpower Bill which authorized legislation that included provisions for curriculum development, residency program development and support for regional consortia for development of optometry schools. Dr. Peters also wrote a memorandum on October 6, 1976 to Dr. S. Richardson Hill informing him of the passage the Veterans Omnibus Bill, Dr. Haber's support of the BRC, and a request to transfer the Special Projects Grant (Optometry-Ophthalmology Interdisciplinary Training Grant) from optometry to Dr. Hill's office. This would relieve the problem of ophthalmologists being paid from an optometry grant.³⁹

Dr. Peters was also instrumental in assisting with the development of VA optometry programs in other VA Hospitals with affiliation with optometry schools or colleges in the same city or area. He was directly responsible for the establishment of the optometry program at the Tuscaloosa VA Hospital. This program has developed into one of the leading optometry training sites in the VA System and continues to be an important part of the UABSO Externship Program and Residency Programs.

Association of University Professors in Ophthalmology Resolution

On November 10, 1976 Dr. Myers received a letter from Dr. Jonathan Wirtschafter, Secretary/Treasurer of the Association of University Professors in Ophthalmology (AUPO), informing him that a resolution had been passed on November 7, 1976 at the AUPO business meeting of the membership.⁴⁰ This resolution stated that the appointment of a Director of Optometry Service within the VA should in no way alter the proper role of this non-medical discipline in the eye care team. Optometrists should continue to report to the Chief of Ophthalmology and, if there is no such position, then the Chief of Surgery, then to the Chief of Staff. In response to the AUPO Resolution and letter Dr. Norman Wallis, President of ASCO, on November 23, 1976, appointed a committee consisting of Drs. Hopping, Peters and Haffner, to develop a draft response for consideration at the next ASCO Board of Directors meeting.⁴¹

Dr. Peters sent a rewrite of a previously submitted statement to Dr. Norman Wallis on December 30, 1976. This rewrite was developed by Drs. Myers, Newcomb and Peters with input from Dr. Hopping and the appointed committee.⁴² On January 5, 1977 ASCO submitted to AUPO and others a "Statement of Position Relative to the Implementation of Optometric Participation in Veterans Administration Hospitals and Clinics under P. L. 94-581".⁴³ Dr. Wallis noted that this Position Statement was unanimously approved by the Board of Directors of ASCO on December 19, 1976.⁴³ The ASCO considered it both inappropriate and totally unacceptable to place optometry (a Service in the VA Central Office) under ophthalmology (a sub-department of the Surgical Service) or under another Service such as the Surgical Service. ASCO was of the opinion, based on six rationales, that optometry should report to the Chief-of-Staff of the hospital or clinic in an administrative organizational chart like dentistry, nursing, pharmacy, and other independently licensed health care professions. Ultimately, optometry's position was not adopted by the VA, which places non-surgical doctors of optometry administratively in a section of the local VA's Surgical Service even to this day.

Features of the BVAH Optometry Service and Facility

Administrative Reporting

In a memorandum dated July 23, 1973, Mr. Clyde Cox, Director of the BVAH, notified the Regional Medical Director at the Veteran's Administration Central Office (VACO) of an organizational change in which the Chief-of-Staff position had been restored at the BVAH. Furthermore, that optometry would now report directly to the Chief-of-Staff instead of the Assistant Director of the Support and Allied Health Services. This organizational change was approved by the VACO June 4, 1973.

At the outset of early discussions with hospital administration, it was decided that optometry should function as a distinct service of the hospital. In this manner the program director would be designated as the Chief-of-the-Optometry Service and report directly to the Chief-of-Staff of the BVAH. The purpose of this reporting relationship was to ensure this program would function independently. As a separate service, optometry would therefore be at the same administrative level as other professional services such as medicine, surgery and dentistry. This administrative structure was indirectly

supported by the Dean of the UABSO serving as a member of the Dean's Committee of the BVAH. The Dean's Committee was an advisory committee to hospital administration on education and research programs conducted in the hospital. Dean Peters also served on the Academic Health Affairs Committee for VAH District 14 which served in a similar capacity for Alabama and Mississippi. Unfortunately this reporting structure was changed nationally by VACO, but this change has not impeded the development of optometry within the VA System.

Features of the Optometry Clinic

The newly renovated Optometry Clinic in the BVAH was a 1,600 gross square foot area on the ground floor of the Hospital. This facility consisted of a reception/waiting area, optical service and repair area, frame selection and dispensing area, special test area, Director's Office, two examination rooms, conference room and an area for ocular fundus photography.

The clinic was staffed by fourth year student interns and optometric technician students, two optometric technicians and the Director. In the beginning, patient care was provided on a part-time basis but the technical and clerical staff was present on a full-time basis. The amount of time for providing clinical care transitioned to staffing the clinic full-time as the class size increased and as curriculum changes permitted.

Patient Demographics

The patient demographics, in general, were middle aged males many of them retired, disabled or not working because of health problems. The patient census of the clinic was by law limited to veterans who were eligible for either in-patient or out-patient services in the BVAH. After 10 months of providing optometric services to veterans, 71% of all patients were found to be in need of eye care. Many veterans had not had any form of vision care since separation from the military. Of those patients needing vision care, glasses were provided to 72% of these veterans. Based on this small sample of services provided, Keller predicted a significant growth in the number of optometrists needed to provide vision care to current and future veterans.³

A follow-up study was reported by Kleinstein and Newcomb related to optometry services provided in the BVAH.⁴⁴ Based on a retrospective case survey of almost 1,500 clinic records, it was determined that the Optometry Service had provided 1,428 comprehensive eye examinations for veteran patients during a two and a half year period. The total number of patient visits for other services was at least double the number of comprehensive eye examinations. Of those receiving comprehensive vision care, 50% had not received any care within the past three years, 35% in over six years and 12.5% had never received care. Over 70% of the patients examined (1,056), required spectacles or a change in their current spectacle prescription. Approximately 14% of the veterans examined were found to have suspected disease or trauma and were referred to physicians in other hospital services. Twenty-six (26) or 1.4% of veterans from this survey were found to be legally blind. This case survey study clearly demonstrated the need for optometric services in this veteran's hospital. In 1975, Dr. Keller left the BVAH to assume the responsibilities of Assistant Dean for Clinic Affairs at

UABSO and Dr. Robert Kleinstein was appointed Interim Chief of Optometry Services. In 1976, Dr. Robert Newcomb was appointed the next Chief-of-Optometry Services in the BVAH. The success of the Birmingham VA Optometry Clinic led to the establishment of other such facilities as opportunities arose. Dr. Peters shared his experiences with his colleagues at national meetings, such as ASCO, and wherever possible, encouraged and facilitated the development of other optometry clinics within the VA.

Conclusion

It is clear that Dr. Peters played a critical role in the establishment of the first academically affiliated optometry teaching program in the VA. In this regard the profession is indebted to Dr. Peters for his insight and leadership. Perhaps there is no clearer evidence of how perceptive Dr. Peters' recognition of the promise optometric services in the VA would hold for teaching, research and patient care than to examine the number of staff optometrists, optometry fellows and residents, and optometry interns currently involved in the VA programs. To place the current staffing levels in some perspective, as late as 1972 there were only nine (9) full-time optometrists in the entire VA system.⁴⁵ Newcomb has reported that prior to 1976 there were only eight (8) full-time optometrists in the VA system.¹ At present, there are 721 staff optometrists; 543 are full-time, 164 are part-time and 14 are intermittent in assignment. There are three (3) clinical research fellows, one (1) Polytrauma Clinical Fellow and one (1) Polytrauma/Traumatic Brain Injury Research Fellow. The latter position is post residency in nature. In addition, there are 211 residents and an estimated 1,200 optometry intern positions and approximately 1,400 rotation opportunities available on an annual basis.⁴⁵

It is clear that the VA has been pleased with the quality of optometric services provided by staff optometrists, fellows, residents and interns as evidenced by many outcome measures. Perhaps the most important outcome measure being that the vast majority of the positions have been funded by the budgets of the local VA hospitals or outpatient clinics.

It seems very likely that more recent military involvement around the world will only serve to increase the demand for optometric services for veterans. It may also be that the growth in postgraduate clinical experiences as a career option will lead to future growth in residency education and fellowship experience in the VA System. The impact the VA has had on optometric education and the profession of optometry has been of great importance. Its importance to staff optometrists, fellows, residents and interns cannot be over-estimated. It is also important to recognize the significant role VA optometrists play in providing primary and secondary eye care to the nation's veterans. It is clear that optometry has provided excellent clinical care while allowing the VA System to provide timely care to those who have borne the battle.

Acknowledgment

I thank Drs. Bob Newcomb and John Townsend for sharing information related to various aspects of optometry in the VA. I also want to thank Mr. Tim Pennycuff and

Jennifer Beck of the UAB Archives for their assistance in locating information from Dr. Peters' files referenced in this paper.

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APPENDIX I

Interprofessional Relations Between Optometry and Ophthalmology at UAB

It is not surprising that the funding and support of an optometry service in the BVAH would be a cause for concern on the part of ophthalmology. It was apparent to both local ophthalmologists and those on the national level, that the establishment of an optometry teaching clinic in the BVAH could have far reaching implications for both professions.

As early as October 23, 1972, Dr. Ralph Z. Levene, Chairman of the University of Alabama, School of Medicine's Department of Ophthalmology, wrote to Mr. Clyde Cox, Director of BVAH, Dr. Clifton Meador, Dean of the UA School of Medicine and Dr. S. Richardson Hill, Vice President for Health Affairs at UAB seeking clarification as to whether physicians had ultimate responsibility for patient care.¹ On November 15, 1972 Mr. Cox wrote a Report of Contact memo in which he reported the findings of Dr. Benjamin Wells, Deputy Chief Medical Director, VACO. Dr. Wells had called Mr. Cox concerning the question raised by Dr. Hill on patients referred to the clinical optometry facility. Dr. Wells had this question investigated by the legal department. It was determined that no law addressed this question and that policy is established by the

Administrator of the VA and the Chief Medical Director as to the treatment of veterans. In summary, Dr. Wells stated that no case could be made about anything that would be in the law or regulations that would prevent an optometrist from doing anything he does in a private sector.² In other words, it was generally the policy to follow traditional patterns as prevailed in private practice.

On November 23, 1973, Dr. Levene sent a Memorandum to Drs. Hill, Pittman (Dean, UASOM), Peters and Aldrete.³ In this memo he included a schematic outline of an Ophthalmology-Optometry Program in the VA and a request for additional funding for new space for ophthalmology as an independent service in the Medical-Surgical Unit of the BVAH instead of as a Division of Surgery. He also presented a detailed joint proposal for optometry and ophthalmology for the Blind Rehabilitation Program and incorporation of adjacent space for the two professions within an expanded BRC. Under the heading "Logistics of Patient Care Between the Two Professions" Dr. Levene stated that most patients will be seen first by optometry except for direct referrals to ophthalmology, patients requesting to be seen by ophthalmology or those with obvious disease requiring the services of ophthalmology. To monitor appropriate referrals from optometry to ophthalmology, a flexible set of criteria for referral was to be established, as well as periodic referrals on a random basis to allow comparison of the results of the examinations of the two professions. The sample size was to be determined by ophthalmology. This methodology was to be utilized to assess the adequacy of the referrals and examinations by each profession. Referrals to other medical and surgical units were to be made only after consultation with ophthalmology.

In a subsequent Memorandum entitled "Teaching Optometrists by Ophthalmologists" sent on January 2, 1974 to all staff members and senior residents, Dr. Levene outlined five items related to this broader issue.⁴ This memo was also copied to Drs. Hill, Pittman, and Peters. These were as follows:

1. The ophthalmology community will teach optometrists to detect ocular disease for referral.
2. Such teaching will stop immediately if optometry proposes unilateral legislation unacceptable to ophthalmology.
3. Referrals from optometrists to ophthalmologists must be distributed to many in the community, particularly younger ophthalmologists starting out, rather than a select few. Any pattern of referrals by the School of Optometry that is unacceptable to the community of ophthalmologists will result in cessation of teaching.
4. All teaching by ophthalmologists should be channeled through the official Combined Eye Program. If optometry accepts independent teaching by other individual ophthalmologists the teaching through the combined Program in Ophthalmology will stop.
5. The ophthalmologists will be compensated for their time by a fee from the School of Optometry.

Not surprisingly Dr. Peters, after consulting with faculty members and those in the optometric community, responded to Dr. Levene's proposal. On February 22, 1974, he answered by responding to each proposition as well as sharing his own concerns

regarding this memo.⁵ (Due to the length of the letter some of the responses have been paraphrased).

1. The statement that the ophthalmological community will teach optometry students to detect ocular disease for referral is inadequate. Since the community does not teach does this mean the Department of Ophthalmology will assume this relationship (a proper interdepartmental relationship in a university?). Secondly, the very restrictive implications of “detect ocular disease for referral” seems to preclude knowledge about, understanding of ocular disease or ocular manifestations of systemic disease and the necessary decision making process by the optometrist as to whether or not to refer. The more optometry students know about ocular disease, the better they will be able to serve the public.
2. This statement is that teaching will stop if optometry (any optometrist?) proposes unilateral legislation unacceptable to ophthalmology (any ophthalmologist?). Dr. Peters could not agree to give such assurance or carry it out if given. Neither the Alabama State Board of Optometry nor the Alabama Optometric Association would give him the right to bargain away their political birthright for any purpose, nor should they. As an alternate solution Dr. Peters proposes the formation of an Alabama Inter-professional Committee on Eye Care. This Committee, composed of individuals of common purpose, open minded men of good will could consider in open discussion all legislative matters affecting either or both professions. With such a committee there is a good possibility of establishing communication and cooperation – instead of the coercion implied in his (Dr. Levene’s) statement.
3. The statement regarding referrals seems to imply that the “ophthalmological community” wishes to control or direct referrals from the School of Optometry to “deserving” ophthalmologists and again the coercive phrase (referring to the “ophthalmological community”, I believe). Dr. Peters states he believes this (such controlling action) would violate medical ethics. The faculty will refer their patients to that practitioner or those practitioners whom they feel will best serve their patient’s needs. This (referral) usually involves some cooperation between the optometrist and ophthalmologist and if the young ophthalmologists cooperate with faculty (even be reasonably courteous and not make unnecessarily derogatory comments to patients) in other words, behave in a civil manner, they will receive referrals.
4. This statement relates to control of “all teaching by ophthalmologists” by the “official Combined Eye Program”. I believe this is unnecessarily restrictive unless the “official Combined Eye Program” is exceptionally responsive to our needs and has within its staff experts in all aspects of vision care. The School does call on outside consultants, experts, researchers, etc., with unique knowledge to supplement knowledge of the faculty for the benefit of students. Since the School is responsible for the student’s education, it must be responsible for those individuals brought in to teach, be they regular faculty, consultants or whatever.
5. The School has agreed from the start to compensate those who teach students. By the same token the School wishes to monitor and evaluate the teaching effectiveness of the faculty (or others).

Dr. Peters then discusses several other considerations he wishes to bring to Dr. Levene's attention. These matters are as follows:

- a) Dr. Peters believes that in a university there is a general obligation to teach, that is, to transmit existing knowledge to bona fide students. In this regard Dr. Peters believes it is Dr. Levene's department's obligation to teach School of Optometry students (one might assume Dr. Peters is referring primarily to professional students since this was the only program that existed at this time in the School). Furthermore, Dr. Peters states that you (Dr. Levene and the Department of Ophthalmology) should do this out of self-interest. The more sophisticated the optometry students (and optometrists) become with regard to ocular disease and ocular manifestations of systemic disease, the better and more competent they will become in referring appropriate patients to ophthalmologists.
- b) It seems to Dr. Peters that this exchange of faculty resources should be a two-way street. The School has some exceptionally knowledgeable and talented young faculty in basic visual science, who have much to offer ophthalmology residents. Dr. Peters acknowledges the traditional trip ophthalmology residents make to New Hampshire or California for basic visual science. Dr. Peters thinks that Dr. Levene should consider strengthening this training by using the School's basic visual science faculty on the same basis as the School of Optometry would use the faculty of the Department of Ophthalmology. Dr. Peters also feels the School's clinical faculty could also contribute to the department of ophthalmology's program in such areas as low vision, contact lenses and binocular vision. Such an interaction between the two faculties would do much to establish the kind of cooperative climate for future practice they both desire.
- c) The problem of Dr. Darrell Rains is one that concerns Dr. Peters. First, each of the faculty and a number of community optometrists had referred patients to him with a wide variety of ocular conditions. He has been uniformly courteous, helpful and skillful in his handling of these patients. None of the faculty or community optometrists had even hinted at "unnecessary surgery" and, while one may say it is not optometry's place to judge, optometrists are not without experience in such matters. If Dr. Rains has been forced to resign from the staff of Eye Foundation Hospital because of his obvious cooperation with the School of Optometry, then I am deeply disturbed. When Dr. Rains leaves, as he is planning to do, that will reduce optometry's options and it will be forced to deal with the "ophthalmological community" which does not include Dr. Rains. If, Dr. Levene, your commitment is to deal fairly, honestly and courteously with the patients referred, and the optometrists, then this new arrangement will work; but if you use the coercive tactics expressed in your memo, it will not.

Finally Dr. Peters makes a genuine plea for Dr. Levene to drop the adversarial posture and make a real effort to treat each other and the patients in cooperation, harmony, courtesy and mutual respect. Dr. Peters believes such a spirit can make a real contribution to the visual welfare of the public and demonstrate to each profession that such a working relation can be beneficial to all. Dr. Peters pledges himself to such an effort.

On February 26, 1974 Dr. Levene responded to Dr. Peters' reply.⁶ In this response, Dr. Levene stated he believes that all questions raised by Dr. Peters can be satisfactorily resolved except the ones relating to his statement that teaching will stop if optometry proposes unilateral legislation unacceptable to ophthalmology. Since this is the most important point and historically the reason teaching was withdrawn he chose to limit his remarks to this subject.

Dr. Levene shared a copy of a proposed resolution on Ophthalmology-Optometry with Dr. Peters. Dr. Peters subsequently sent this proposal to Dr. William R. Baldwin.⁷ An up-to-date ophthalmological viewpoint on this subject and related matters had been proposed by Drs. John Henderson, Ralph Levene and Robert Reinecke as an unofficial position paper for the Association of University Professors of Ophthalmology (AUPO) and presented to the group on November 5, 1973. The paper was received but not voted on at the time it was received.

In essence ophthalmology was bitterly opposed to significant portions of legislation by optometry because such teaching had not only been used to increase the skills of optometrists, but as a powerful weapon in legislative battles between the two professions. Dr. Levene acknowledged it was optometry's birthright to propose, politic and fight for legislation it believed in but it was also ophthalmology's birthright to do the same if they believed such legislation is wrong. In a teaching institution ophthalmology feels an obligation to teach but only if it has a guarantee that such teaching will not be used against them in legislative battles. Furthermore, he claims Dr. Peters persists in separating teaching and legislation but in the legislative battles optometry fuses the two. Ophthalmology on the other hand views the two within one framework and will not consider one without the other. Even where teaching does not enter directly in optometry's legislative proposals it does not make sense to teach on one hand and fight on the other. Dr. Levene concluded by echoing Dr. Peters' suggestion of an inter-professional committee to consider all problems within the two groups.

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APPENDIX II

New Federal Legislation

Appendix II has been included because of the unique and accurate forecasting for the future of VA optometry that is contained in it, as well the appearance, in part, of this important information in the Congressional Record.

In an effort to resolve deficiencies in the Nation's health care system, the one issue on which consensus existed, was the need to develop the necessary numbers and types of health professionals to meet the needs of a growing population. To this end, the U.S. Congress had recently enacted the Comprehensive Health Manpower Training Act of 1971. Based on the scope of this Act it was of great importance to the American Optometric Association (AOA) that it be included, involved in and work to support the passage of this legislation. This Act amended the Health Professions Educational Assistance Act (HPEAA) of 1963 which among other features provided financial assistance to health profession schools and colleges to increase manpower (workforce). This Act and subsequent legislation provide financial assistance to many schools and colleges of optometry including UABSO.

Alan M. Cranston served as a U.S. Senator for 24 years (D-California). He served on two occasions as the Senate Majority Whip and one as the Senate Minority Whip (1997-1990). From 1977 to 1981 he served as the Chair of the Senate Veteran's Affairs Committee. Senator Cranston had a keen interest in health care manpower and health care policy issues. The summary that follows was published in the Senate Congressional Record on March 23, 1972.¹

On March 2, 1972, Senator Cranston addressed the annual meeting of the Western States Optometric Conference. In his address Senator Cranston commented on issues such as manpower (workforce) distribution and the need for more optometrists, perhaps as many as 15,500 additional by 1980, the extension of the Health Manpower Educational Assistance Act in the fall of 1971 and the retention of federal support for optometry schools and colleges under provisions of this Act. In addition, he mentioned that congress had restored \$1M for Special Project Grants and financial distress funding for schools of optometry as well as increasing the level of capitation support from 60% to 74%. Finally he addressed the need for better utilization

of existing physical facilities such as the Veterans Administration Hospitals as clinical teaching facilities for various health care specialties.

Senator Cranston, who served as Chairman of the Subcommittee on Health and Hospitals of the Veterans Affairs Committee, introduced several bills to accomplish this purpose. He introduced Senate Bill 2219 entitled the "Veterans Administration Health Manpower Training Act". The Act, if passed, would create a system in which fourth year students in optometry schools and colleges affiliated with VA facilities could take a portion of their clinical training in excellent clinical teaching settings in VA facilities, while improving the availability of visual services to eligible individuals through the VA health program. This bill also included the important aspect of a program for continuing educational of professional and other health personnel on the staff of VA hospitals.

Perhaps more germane to the discussion of optometry and BVAH was Senator Cranston's next statement. During this same address he announced the introduction of S 2354 which was the proposed "Health Care Expansion Act of 1972". Senator Cranston stated during subcommittee hearings related to this Bill on February 16, 1972 he offered an amendment to establish the position Director of Optometry in the Veterans Administration, Department of Medicine and Surgery. Furthermore, the subcommittee had voted unanimously to report favorably on the Bill and the amendment to the full committee. This new position Director of Optometry would be at the same level as the VA's heads of other professional disciplines.

Senator Cranston also announced to the attendees at this same conference that the VA had just initiated an affiliation between the UAB School of Optometry and BVAH to provide a pilot training program for optometrists and optometric technicians. He acknowledged this as the first such program in the VA System and stated it could serve as a model for similarly affiliated accredited schools and colleges of optometry and nearby VA teaching hospitals after S 2219 and S 2354 are enacted. Ultimately Public Law 93-82 created the position of Director of Optometry in 1973, PL 94-581 created a Director of Optometry Services in 1976 and subsequent Congressional and Agency Reports were instrumental in the Veterans Omnibus Health Care Act of 1976 which served to establish Optometry as a section reporting to either the Surgical Service or Chief-of-Staff. It also improved the compensation of optometrists by removing them from Civil Service and placing them under Title 38.

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Notes on Optometric Education Around the Beginning of the Twentieth Century

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Abstract

Optometric education existed in various forms around the beginning of the twentieth century. Backgrounds of the proprietors of the schools and the length of study varied from school to school. This article provides an overview of optometric education at that time and of some of the schools.

Key words: *optometric education, optometry history*

At the beginning of the twentieth century, the term optometry had not yet become common, and its practice was often referred to as “optics.” Optometrists referred to themselves by terms such as opticians or sight testers. Optometry (or optics) schools had attendance or correspondence options and the requirements and length of study varied from school to school. In an 1899 issue of *Optical Journal*, there was a “Directory of Reputable Optical Colleges.”¹ There was no indication of the criteria by which such a list was established. The schools listed were as follows:

ATLANTA, GEORGIA

Kellam & Moore’s College of Optics.

CHICAGO, ILLINOIS

Chicago Ophthalmic College and Hospital, 607 Van Buren St., Dr. H.M. Martin, President.

Northern Illinois College of Ophthalmology and Otology, Masonic Temple, Drs. J.B. and G.W. McFatrigh, Pres. and Sec.

McCormick Optical College, 84 Adams St., Dr. Charles McCormick, Pres.

LA PORTE, INDIANA

Hutchinson School, J.L. Hutchinson, Supt.

SOUTH BEND, INDIANA

South Bend College of Optics, Dr. H.A. Thomson.

BOSTON, MASSACHUSETTS

Klein School of Optics, 2 Rutland St., August Klein, M.D., Pres.

New England Optical Institute, 3 Winter St., C.E. Tucker, Sec.

Dr. Edwin S. Foster, Private, 120 Tremont St.

DETROIT, MICHIGAN

Detroit Optical Institute, Dr. John S. Owen.

KANSAS CITY, MISSOURI

Kansas City Optical College, Tenth and Walnut Sts., Dr. J.T. Hamilton.

NEW YORK CITY

Spencer Optical Institute, 15 Maiden Lane, J.E. Spencer, Pres.

American Ophthalmic Institute, 177 Broadway, Dr. R.H. Knowles.
L.L. Ferguson, 32 Maiden Lane.
SYRACUSE, NEW YORK
Syracuse School of Optics, Hitchcock & Morse.
MCMINNVILLE, OREGON
Dr. C.W. Lowe, Private.
PHILADELPHIA, PENNSYLVANIA
Philadelphia Optical College, 1435 Chestnut St., Dr. C.H. Brown, Pres.
TORONTO, CANADA
Optical Institute of Canada, 88 Yonge St., Dr. W.E. Hamill.

The optometry schools of the day were for-profit enterprises, and the backgrounds of their proprietors varied. Some schools were run by doctors of medicine, some by optometrists, and some by optical companies presumably to train people to use the goods that they sold. Gregg² noted that in the 1890s, the Spencer Optical Company gave a two-week refraction course, and the King Optical Company of Cleveland, Ohio and New York City gave a one-week course for jewelers to learn the fitting of glasses. The Spencer Optical Company taught use of the Audemaire Trial Case which they manufactured. The King company made the Elite Test Case.³

There was no standardization of educational programs. Some described as post-graduate were designed to educate those who were already doing optometric work at some level. The Julius King Optical Company of 14 Maiden Lane, New York, announced “a post-graduate course in refraction” in an 1896 issue of *Optical Journal*. The advertisement stated: “beginning February 1 and continuing indefinitely thereafter, we have arranged to give advanced individual private instruction, to those who have been making a specialty of Refraction and the mechanical adjustment of frames. These courses will embrace instruction in the use of the Ophthalmometer, Retinoscopy, Ophthalmoscope, Refractometer, Prisms, and kindred subjects. Students may select, at their option, any or all of these studies. Those desiring to avail themselves of this opportunity may make application at any time, as no regular classes will be formed. We have found individual attention to students much more satisfactory to them and to ourselves. Thorough and complete directions and actual practice in the use of Test Lenses will be given at any time to students who have had little or no experience in fitting eyes.”⁴ No statement was made in the advertisement about the length of time required to take that instruction, but it seems likely to have been variable depending on the subjects which students elected to study.

The backgrounds of optometry students varied. They included doctors of medicine, jewelers, watchmakers, pharmacists, and others who wished to make “optics” their life’s work. The following news item in the *Optical Journal* illustrates that varied background: “R.H. Bailey, M.D., of Mattoon, Ill., and M.E. Mosher, M.D., of Havana, Ill., are taking a course in optics at the Northern Illinois College of Ophthalmology & Otology

of Chicago. Charles F. Rauth, a jeweler of Springfield, Ill., is a recent graduate and Dr. W.B. Richardson, optician of Spokane, Wash., has had the degree 'Doctor of Optics' conferred upon him by the same institution."¹

Northern Illinois College of Ophthalmology and Otology

One of the schools on the list above is the Northern Illinois College of Ophthalmology and Otology (NICOO), which is one of the predecessor schools of the present-day Illinois College of Optometry. Dr. Henry Olin started the Chicago College of Ophthalmology and Otology in 1872. In 1887, James McFatrach joined Olin in ophthalmology practice and as a member of Olin's faculty. McFatrach took over the school in 1889 when Olin retired. In 1891, McFatrach changed the name of the school to NICOO. George W. McFatrach joined the faculty in 1893.⁵ Before 1898, most of their students were doctors of medicine, but after that the majority of their students were jewelers, dispensing opticians, and refracting opticians.⁶

Philadelphia Optical College

The Philadelphia Optical College was founded in 1889. Its initial instructor and president was Christian Henry Brown, M.D.⁷ In 1900, the Philadelphia Optical College advertised six month, three month, one month, special, and post-graduate attendance courses and correspondence courses. The shorter courses were designed for persons who were already doing optical work.

Klein School of Optics

The Klein School of Optics was founded in 1894 by August Andreas Klein, who was born in Germany in 1846. Klein came to the United States when he was 16 years old.⁸ Klein graduated from the Boston University School of Medicine in 1882, and he studied ophthalmology in Germany. Klein School of Optics had a faculty of seven, including August Klein and three of his children. The one year curriculum offered instruction in optics, anatomy, pathology, mathematics, physics, dispensing, and refraction.⁸ The tuition was \$75 for a full course and \$30 for a single term. The name of the Klein School of Optics was changed to Massachusetts College of Optometry in 1901. It later became the New England College of Optometry.

Hutchinson School

In 1886, J.R. Parsons started the Parsons Horological Institute in LaPorte, Indiana, to teach watchmaking.^{9,10} In 1888, A.J. Hutchinson went to work for Parsons. Shortly thereafter, Hutchinson resigned and with J.H. William Meyer founded the Hutchinson School of Watchmaking and Optics. It is of interest that in 1892, Lydia Moss Bradley purchased the Parsons Institute and moved it to Peoria, Illinois, where it became the Bradley Polytechnic Institute and then later Bradley University. The Bradley Polytechnic Institute offered instruction in optics until about 1926.¹¹

An 1896 advertisement for the Hutchinson school said: "Optical Students cannot find a more comprehensive and complete course in Optics than that given at Hutchinson's School for Watchmakers, Engravers and Opticians. Next course commences January 6, 1896. J.H. Wm. Meyer, M.D., Lecturer in Optics...J.L.

Hutchinson, Supt., LaPorte, Ind.”⁴ It may be presumed that the Hutchinson School ceased operation by at least 1912 because the list of optometry schools in the 1912 *Blue Book of Optometrists and Opticians* does not include it.¹¹

South Bend College of Optics

The South Bend College of Optics was founded in 1893.¹² From 1893 to 1901 it offered attendance and correspondence courses. In 1901, it discontinued the attendance courses to concentrate on the correspondence course. In 1912, its president H.A. Thomson announced that it would start its attendance courses again.¹³ South Bend College of Optics discontinued its operation in about 1920.¹¹ In 1899, South Bend College of Optics charged \$50 for its attendance course and \$25 for its correspondence course.¹⁴ In 1903, it announced that its rate had been reduced to \$7.50 for the correspondence course and Doctor of Optics diploma.¹⁵

A 1906 advertisement for the South Bend College of Optics said that: “We settle the question of prisms. Our course in optics tells you just when and how to prescribe prisms and when to let them alone.” After claiming that their rules for prescribing prisms have “never been known to fail,” the advertisement mentions that the course teaches the correction of astigmatism and the use of the ophthalmoscope, retinoscope, and trial set. The school also claimed to be “the most thorough and painstaking optical college in America.”¹⁶

H.A. Thomson copyrighted his correspondence course in 1895. It was reprinted in 1975 by Professional Press with a 30 page historical commentary by Monroe Hirsch.¹⁷ The course consisted of 180 pages in 20 lessons. Each lesson had text to read and questions to answer plus a reading assignment from *Hartridge on Refraction*. There was a total of 333 questions. Students were instructed that they were not to send in the answers to the questions except for the questions they received with lessons 18 and 20 which served as the final examination for the course. For all other questions Thomson sent answers and explanations with the next set of lessons. Students were also advised to purchase a blank notebook and write down rules that were presented in each lesson, a total of 214 rules in the 20 lessons. The course was designed to be a ten week course with two lessons sent to students each week.

A diploma was awarded to those students who achieved the requisite score on the final examination. H.A. Thomson was not only president of the South Bend College of Optics, but also president of the Thomson Optical Company which sold trial sets and other optical equipment.

Lessons 1-5 covered propagation of light, reflection, refraction by curved surfaces and lenses, spherical aberration, and chromatic aberration. Topics in lessons 6-8 were refraction by the eye, accommodation, and convergence. Lessons 9 and 10 dealt with subjective refraction, the cobalt blue test, estimating refractive error with ophthalmoscopy, and retinoscopy.

In lesson 9, Thomson expresses a negative opinion of the use of optometers. This passage also gives a description of the optometers in use at that time: "Although I hope none of my pupils will ever be so unscientific as to use an optometer, it is desirable to understand the principles upon which it is constructed. The common optometer consists of a convex lens through which the patient looks at a card attached to a slide. The card is moved until seen most distinctly, when we have the focus of that eye. If it stopped at the principal focus of the lens we know that the rays emerged parallel and that he is emmetropic. If beyond the principal focus they emerged converging showing him to be hypermetropic; if nearer than the focus, diverging, and he is myopic. By marking the slide at different distances we have only to look where the card stands and the number tells us the glass required. Other more complicated optometers are upon the market, but are based upon the same principle. The objection is that accommodation, convergence, astigmatism, etc., are not considered, thus rendering the instruments inaccurate."¹⁸

Hypermetropia, myopia, astigmatism, and anisometropia were the subjects of lessons 11, 12, 13, and 14, respectively. Lessons 15 and 16 were entitled "Practical Work," and looked at general tips in conducting an examination, illuminating and equipping the examination room, order of testing, questions to ask the patient during testing, and prescription of lenses. Retinoscopy was presented in more depth in lesson 17 than the introduction to it in lesson 10.

In lesson 18, the student learned about converting optical crosses to prescriptions, transposing prescriptions, distinguishing types of astigmatism (mixed, simple, compound), lens materials, and ordering lenses and frames. Topics in lesson 19 were heterophoria and prisms. Testing procedures described in this lesson are what we would recognize as the von Graefe and Maddox rod phoria tests. Among the rules that students were told to copy into their notebooks were rules 199 and 200: "In prescribing prisms never give over one-half to two-thirds the full correction....Patients to whom prisms are given should be requested to return in about two weeks for re-examination of the eyes."¹⁹ In lesson 20 there was further discussion of heterophoria and mention of some common diseases such as cataract, pterygium, glaucoma, nystagmus, and tobacco and alcohol amblyopia, as well as the recommendation that: "A hand-book of the different diseases of the eye should be in every optician's library for constant reference and study."²⁰

Thomson closed lesson 20 with words of encouragement: "Our course of lessons is ended. The course of study upon your part is, I hope, just begun. I have endeavored to guide you on the right path of study and research in this interesting science, until you would have a sufficient understanding of the work to enable you to continue upon your own footing....Hoping that you may attain the highest position in the field which you have chosen, and with many thanks for your kind co-operation in making this course a pleasure and success, I am, Your Friend and Teacher, Dr. H.A. Thomson."²¹

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“Optometrist of the Stars”: His Wife Remembers

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The news reporters called him the “Optometrist of the Stars” and my husband, Harold “Doc” Roland earned and deserved the name. Originally from Detroit, he and I have for the past 24 years been residents of Sarasota, Florida. Harold died in January, 2013 at the ripe age of 94.

Roland took care of countless famous patients of the entertainment world, starting with the Motown Artists. His reputation spread to celebrities in New York and California. Famous folks sought him out in Southfield, Michigan for his expertise and proficiency in providing eyewear that was not only functional but also very chic and outstanding.

I recall his involvement with Michael Jackson. The Jackson people contacted our office about designing a signature pair of glasses Michael could wear and also give away or endorse. We went back and forth with costs and distribution only to have his team finally decline the proposition. However, we were asked to invest in Jackson’s other endorsements, including stuffed animals that were to be promoted in movie theatres with proceeds going to charity. There is a sad part of this adventure. There was a good presentation from Michael’s co-producer and mentor, Quincy Jones, so we and mutual friends did invest. Needless to say, once Michael’s legal actions began, everything was shelved; he lost his endorsements, and we lost our investment!

Harold took care of many Motown entertainers, including Berry Gordy’s family, Marvin Gaye, and others, John Denver, Johnny Mathis, and local TV stars. Our office provided eyewear for album covers for Bob Seeger’s group as well.

I remember when he fitted Peggy Cass with contacts to wear on stage. She freaked out after the first performance! Why? Ms. Cass said she had never been able to see anyone in the front row before, and now that she could, it threw her off.

And then there was a “Damon Runyan” character who came into the office and asked “Doc” Roland to make him some special contact lenses that had a yellow cast to them in order to read the marked cards in high stake games.

Another interesting story: we got a call from a man in Dubai, who had seen an unusual pair of glasses on someone working there and wanted the same frame. We told him he had to be custom measured for this frame, so he flew in from Dubai and ordered several pairs. The frame was so unusual. You and the patient selected the shape for the lenses and instead of temples, the lenses were drilled to hold two almost

invisible “cat gut” wires that were connected to the earpieces on each side. It looked like the lenses were just floating in the front of the face.

Actor John Amos wore this frame as well. It was very fragile, but the appearance was startling and an attention getter.



Figure 1. Dr. Roland with Johnny Mathis

Harold’s involvement with celebrities included playing in golf tournaments with persons such as James Garner, Jack Jones, and Jamie Farr. And when stars were touring in the Detroit area, Harold put together tee times for them.

In addition to practice, Harold hosted his own radio talk show, made many television appearances. Before he became an optometrist, he was a singer on radio and appeared often with a comic named Amos Jacobs. Amos later changed his name to Danny Thomas when he left the radio show.

Harold also was part owner of a horse farm and had many winning thoroughbreds, including the #2 horse in the country in 1971. “Governor Max” won the Washington Futurity and was unfortunately injured while being shipped to the next race before the Kentucky Derby. He also won Breeder of the Year Award in Michigan.

Dr. Harold Rowland graduated from the Northern Illinois College of Optometry (now called ICO) and served in the army during World War II for over five years, handling vision problems for U.S. soldiers and German prisoners of war. Up to the very end, he enjoyed talking with new optometrists and offering advice.

William Kitchiner (1775-1827), Author of *The Economy of the Eyes*

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Abstract

*William Kitchiner (1775-1827) was variously described as a physician, optician, musician, and gastronome. This paper provides a brief biographical sketch and comments on his book *The Economy of the Eyes*.*

Key words: *optometry books, optometry history, telescopes*

William Kitchiner was born in London, England and lived most of his life there. He attended medical school in Glasgow. Most references state that he held an M.D. degree, but Bridge and English questioned whether he completed the degree.¹⁻⁴ He inherited a large annual income from his father, and he never practiced medicine.

Some publications refer to Kitchiner as an optician.^{2,3} This may have been due to his years of work on telescopes, but it has also been stated that he sold spectacles “from his home and other outlets.”⁵ He claimed to have invented a telescope with variable magnification, but John Herschel called it “Mr. G. Dollond’s Pancratic Telescope.”⁶

Kitchiner’s interests also extended to music and food. In fact, he is best known for his book *The Cook’s Oracle*, which went through many editions. Bridge and English called it “most extraordinary, the most entertaining and the most bizarre cookery book of the nineteenth century.”⁷ They believed that the source of the book’s success was Kitchiner’s “meticulous attention to detail.”⁸ Kitchiner also emphasized that fresh food and a balanced diet were important.⁹ He held dinner parties with regular guests he called the Committee of Taste to try out recipes.

Kitchiner authored many books, the first two of which were *A Companion to the Telescope* (1811) and *Practical Observations on Telescopes* (1815). *The Cook’s Oracle* was first published in 1817. That was followed by *Practical Observations on Telescopes, Opera Glasses, and Spectacles* in 1818, *Observations of Vocal Music* in 1821, and *Directions for Invigorating and Prolonging Life* in 1822. *The Economy of the Eyes* was published in two parts in 1824 and 1825. Part I had the subtitle *Precepts of the Improvement and Preservation of the Sight*, and the subtitle for Part II was *Of Telescopes*. His other books were *The Housekeeper’s Ledger* (1825) and *The Traveller’s Oracle* (1827).

Part I of *The Economy of the Eyes* contained information on vision and guidance for the general public on selection and use of spectacles. On page 14, Kitchiner

advised that: "When You go to an Optician's to choose Spectacles, the first thing to attend to is to look at a Book with each eye alternately, – and carefully ascertain if You see equally well, with both Eyes, with the same Glass, at exactly the same distance. Inequality of the focus of the Eyes is much more common than is generally supposed."

As could be expected, much of the advice related to presbyopia. Kitchiner observed that: "The average period of the Eyes requiring Spectacles to read with, is about the 45th year." (p. 24) "The first indication of the Eye beginning to be impaired by Age, is that when You wish to read a small print, You are obliged to remove it further from your Eye than You have been accustomed to do..." (p. 25)

Kitchiner explained that the power of convex lenses needed for near vision increased with age. He gave the focal length of convex lenses commonly required at various ages as: 36 inches at 40 years, 30 inches at 45 years, 24 inches at 50 years, 20 inches at 55 years, 16 inches at 60 years, 14 inches at 65 years, 12 inches at 70 years, 10 inches at 75 years, 9 inches at 80 years, 8 inches at 85 years, 7 inches at 90 years, and 6 inches at 100 years. He noted that lenses were not convex enough if one had to hold a book far from the eyes, and they were too convex if one had to hold a book "nearer to your Eyes than when your Sight was good." (p. 45)

A numbering of concave lenses that Kitchiner suggested came from Jesse Ramsden was: concave no. 1, 24 inches focus; concave no. 2, 21 inches focus; and concave no. 3, 18 inches. Kitchiner noted that he himself was short-sighted and that he mostly wore a no. 2.

In Part I of *The Economy of the Eyes* Kitchiner gave advice on many other aspects of vision, such as types of illumination, use of window shutters, selection of spectacle frames, use of opera glasses, and getting a good view of the stage in various theaters. He suggested that for determining proper power of spectacle lenses, an optometer can be used by persons who reside a long distance from an optician, but it is better to visit the optician and view through lenses if possible.

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Robert Klark Graham (1906-1997)

Editor's Note: Jack Runniger suggested that *Hindsight* readers would be interested in learning something about the life of optometrist Robert K. Graham. He submitted a column he recently wrote for *Optometric Management* and a copy of a talk given by Richard L. Hopping. They are reprinted here with permission. Runniger also suggested that an excerpt from Graham's autobiography would be of interest, and he provided a copy of that book inscribed to him by Graham so such an excerpt could be included here.

Lessons Learned: From Hard Resin Lenses to Sperm Banks

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Optometrist Robert Klark Graham was born in 1906, and died in 1997. The story of his life is a fascinating tale. Accomplished singer, then optometrist, then inventor, then multimillionaire, then famous geneticist.

"I wasted seven college years studying singing," he said in his autobiography. Although his voice was described as being "almost exceptional" (he sang solos twice at the Metropolitan Opera House in New York), he discovered he wasn't quite good enough to make a living at it. An attorney friend of his family fortunately talked Graham into instead pursuing a career in optometry.

The new career

The man was obviously brilliant. He enrolled at Ohio State in 1935 to pursue his optometry degree. Through persistence he finally convinced school authorities to allow him to take the four year course in just two years, since he had ranked in the upper 1% in the college's entrance exam.

Even so, he was over 30 years old by the time he got his degree. After graduation he went to work for Bausch and Lomb and then Univis to participate in their research in making ophthalmic lenses out of plastic. After the project was discontinued, Graham and his team left and formed their own company, Armorlite Lens Co.

"We did not know how to manufacture a plastic lens successfully, but we knew (from the years of research at Univis) a great many things *not* to do," he said. They were finally able to produce "superb" PMMA ophthalmic lenses. They had but one fault. They were easily scratched. After further research they were successful in producing hard resin ophthalmic lenses, thirty times more resistant to scratching than PMMA, which have now almost completely replaced glass lenses. To support himself during this research he opened an optometric practice limited solely to contact lenses.

Multitalented

“It was slow, for in those days we had only scleral contact lenses, fitted by taking an impression of the eye,” he wrote in describing his practice. “We considered four hours of wearing time quite successful.” In addition he taught at Southern California College of Optometry, serving as associate professor of contact lens and low vision courses. He is also credited with the introduction of a reflection-reducing coating for ophthalmic lenses, the development of colorless ultraviolet absorbing lenses, the invention of the variable focus lens, and the invention of the hybrid corneal lens.

The sale of Armorlite and plastic lens patents made him a multimillionaire. Rather than retiring in luxury, in 1963, along with geneticist and Nobel Prize winner Herman Muller, he founded the Repository for Germinal Choice, a sperm bank which collected germinal material only from outstandingly intelligent and healthy men.

The repository received great national publicity and attention. Graham felt that this was a way to improve the intelligence of the human race. Many critics felt that it was Hitler like tactics. Evidently there are today almost 300 children conceived by the Graham repository. Some are reportedly extremely intelligent, but many are not exceptional.

Dr. Robert Klark Graham, Rotary Club of Escondido Recognition Luncheon, January 28, 1997

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It is a very great honor for me to be present today at the Rotary Club of Escondido meeting when you have chosen to honor a most distinguished and accomplished individual and leader, Dr. Robert Klark Graham. I have had the privilege to know and admire him for these past 40 years. As most of you have also known Dr. Graham for some time, you may be aware of his many accomplishments and honors. However, I should like to share some aspects of his impressive career with you so that all here might know of the magnitude of his long career and the impact he has had on his chosen profession and also the effect those successes have had on the many people who have enjoyed the benefits of his long career in research, contact lens development, low vision lenses and the Repository for Germinal Choice.

Dr. Graham is a man of many faces and many talents. He is an optometrist, writer, lecturer, teacher, researcher, inventor, historian and manufacturer. A person to be any one of these in a lifetime would be considered accomplished. But for one to have succeeded in all is remarkable. Robert Klark Graham proves to be a unique individual. He has achieved in all of these areas, making many contributions to mankind over more than fifty years.

Dr. Graham was born in Harbor Springs, Michigan to Dr. Frank and Ellen Klark Graham in June, 1906. He received a Bachelor of Arts degree from Michigan State University and then matriculated at The Ohio State University where he worked in the field of applied optics, receiving a Bachelor of Science degree in 1937.

Following graduation, Dr. Graham was chosen by Bausch & Lomb Optical Company for special training in optical methods, remaining with that company until 1940. He then joined the Univis Company of Dayton, Ohio, which had begun research relating to plastic ophthalmic lenses. When this project was discontinued by Univis six years later, Dr. Graham decided they had given up too soon. So in 1947 Dr. Graham, taking three Univis research technicians with him to Pasadena, California, established a new company called Plastic Lens Company. The name was later changed to Armorlite Lens Company, and is still one of the nation's leading producers of ophthalmic lenses. At the same time he established a private optometric practice which he limited solely to contact lens service. This was believed to be the first office in the nation to consistently remain limited to this specialty. Dr. Graham was to write later that "it was slow for in those days we had only scleral contact lenses, fitted by taking an impression of the eye. We considered four hours wearing time quite successful." He also taught at the Southern California College of Optometry (then named the Los Angeles College of Optometry) which he related helped him to maintain his family and retain his upstairs optometric office.

From 1948 to 1961, Dr. Graham served at the rank of Associate Professor in charge of the contact lens and low vision courses and clinics at the College. An article appearing in a College publication in 1954 stated that Dr. Graham had "made a place for himself in the heart of every senior student."

Throughout this time he continued his deep interest in science and optics, retaining his memberships in the American Institute of Physics Professors, the American Physical Society, the Optical Society of America, and the American Association for the Advancement of Science to which, in 1958, he was elected to a lifetime membership in "recognition of his standing as a scientist."

Also during these years Dr. Graham was serving as an optometric consultant to Kevin Touhy, the inventor of plastic corneal lenses, and to other optical laboratories including Solex Laboratories and later in the 60's with Bausch & Lomb during their development of the first soft contact lens.

Dr. Graham learned of a clear plastic material called CR-39 developed as a bonding agent for bomber fuel tanks and began to work to develop this material for ophthalmic lenses. After years of experimentation, plastic lens production commenced and for six years his company was the exclusive world-wide source for hard resin lenses. As a result of Dr. Graham's early efforts, fifty years later more than 80 percent of the lenses dispensed in the United States today are made from lightweight plastic.

Not only was Dr. Graham working to develop his lightweight contact lens, he was widely acclaimed for his invention of a low vision spectacle that he developed over five years of research with Dr. William Feinbloom. This lens was labeled a "miracle lens" for certain partially sighted patients who had been previously labeled and treated as blind but could now carry out their daily routines without assistance. Dr. Robert Graham is credited with the development of plastic spectacle lenses, the introduction of a reflection-reducing coating for ophthalmic lenses, the development of colorless ultraviolet absorbing lenses, the invention of the variable focus lens and the invention of the hybrid corneal lens.

Dr. Graham has been a Fellow of the American Academy of Optometry for over fifty years and served as chairman of its Contact Lens Section from 1957 to 1963. He was elected as one of 25 professionals to be a full member of the International Society of Contact Lens Specialists.

He has been the recipient of numerous honors and other awards, including the most prestigious Friederich William Herschel Gold Medal in 1958 in Germany. In 1966 the National Eye Research Foundation presented him with the special Man of Distinction Award as "The Man Who Made it Safe to Wear Glasses."

In 1963 Dr. Graham, along with renowned American geneticist and Nobel prize winner Hermann Muller, founded the Repository for Germinal Choice which collects germinal material from outstandingly intelligent and healthy men. In 1970 he authored the book *The Future of Man*. Following his retirement from Armorlite, he became active in the affairs of the Repository and announced in 1980 that the Repository would offer germinal choice to young married couples who want children but in whom the husband is infertile. Since that time the Repository has become referred to as the Nobel sperm bank and has received wide attention throughout the world.

In 1970 The Wisdom Society for the Advancement of Knowledge, Learning and Research in Education named him an Eminent Recipient of the Wisdom Award of Honor, joining the ranks of such illustrious persons as Winston Churchill, Aaron Copland, Dr. Michael DeBakey, W. Somerset Maugham, Dr. Karl Menninger, Carl Sandburg, Dr. Albert Schweitzer, and others of such accomplishment. That's quite a distinguished list of colleagues, Bob. In 1974 Dr. Graham retired from his contact lens practice, but continued as head of Armorlite until 1978 when the company was acquired by Minnesota Mining and Manufacturing Company.

In 1984 he was elected a Distinguished Practitioner and Member of the National Academies of Practice. Dr. Graham's biography appears in a number of various volumes of *Who's Who*. He holds several patents and has authored numerous articles, two books and one chapter of another book.

In 1987 the American Academy of Optometry awarded Dr. Graham the William Feinbloom Award for his distinguished and significant contributions to clinical science and his direct clinical advancement of visual and optometric service. The Southern

California College of Optometry conferred a Doctor of Ocular Science Honorary Degree upon Bob in 1988. The National Eye Research Foundation presented him with the Leonardo Da Vinci Award in 1989 and The Ohio State University College of Optometry declared Dr. Graham a Distinguished Alumnus in 1987 and later awarded him the Glenn A. Fry Medal in Physiological Optics in 1992.

Last year Dr. Graham observed his 90th birthday with a gala celebration attended by family members and many of his friends. You would think that by now he would be sitting back and reveling in the memories and satisfaction of his many accomplishments. But Bob had a very busy year. He called a meeting of many outstanding eugenists and they decided to establish the Society for the Advancement of Genetics Education. Then Ohio State University College of Optometry established an Ophthalmic Research Laboratory in his name. To wrap up the year, the Optical Laboratories Association presented him with their Directors' Choice Award for outstanding contributions to the eyecare professions and spectacle wearers everywhere. Bob, I hope that if I live that long, my 90th year is as exciting as that!

Dr. Graham is truly a modern day Renaissance man who has made distinguished and significant contributions to clinical excellence, the optometric profession, genetic research and the public's quality of life. Although I have related to you here today some of Dr. Graham's many accomplishments and the honors he has had bestowed upon him, my words are inadequate to properly describe all that this man has contributed to mankind. Bob, I stand in awe and great admiration of your intelligence, your work, your drive and your dedication. It is an honor for me to be here today with your family and many friends and colleagues to participate in saluting you for your lifetime's work and accomplishments. I hope I'm around to attend your 100th birthday celebration!

Excerpt from: Graham RK. R.K.G.: How an Ordinary Man Despite a Very Poor Start, Still Won in Full Measure the Good Things in Life. Washington, DC: Scott-Townsend Publishers, 1996: 40-42, 48, 51, 52.

From time to time I find the news media referring to me as the optometrist who developed hard resin spectacle lenses. Accordingly it might be appropriate for me to outline the development of these lenses.

This is inevitably semi-biographical. When I was graduated from OSU in Applied Optics, I had accepted a position with the Bausch & Lomb Optical Company which gave me some background in optical manufacturing. I subsequently was engaged in further optical manufacturing with the Univis Lens Company.

The Univis Lens Company had acquired the Unbreakable Lens Company of American (TULCA), which had attempted to make ophthalmic lenses of polymethyl-methacrylate (PMMA) under the Lloyd patent. Univis moved the TULCA project from California to Dayton and established a laboratory there to develop the techniques to the point where production would be commercially feasible.

I was interested in the potentialities of the then new optical medium PMMA and so visited the Univis project, reporting in some detail to Bausch & Lomb. (At that time glass ophthalmic lenses were Bausch & Lomb's most profitable product from the standpoint of dollars earned. It is worth noting that, in part because initially they ignored the new medium, they never caught up in the hard resin lens field and, lacking a complete line of lenses, some 40 years later practically ceased to be a supplier of ophthalmic spectacle lenses.)

A few months after my visit to Univis their president, Jack Silverman, offered me a position as their Western Division Manager. This I accepted, being largely persuaded by my interest in the potentialities of their plastic lens project.

Some six years later Univis was confronted by a patent infringement suit filed by Combined Optical Industries, Ltd., of Slough, England, who manufactured Igard lenses of PMMA. The C.O.I.L. patents antedated the Lloyd patent so Univis decided to abandon their plastic lens project. They had employed injection molding, which necessitated the use of high chrome content steel molds so as to withstand extremes of heat and pressure. The mold cost was high and the mold life short. Furthermore, injection invites striae. Univis never reached a point where their costs and reject rate were low enough so that they could enter the market with their product.

I was by then Sales Manager of Univis. When the company closed their plastic lens project I resigned and took with me to Pasadena, California all but one of Univis' plastic lens research technicians. (They were, of course, out of a job in Dayton. Smitty went to Seattle.) We did not know how to manufacture a plastic lens successfully but we knew a great many things *not* to do. We were, for example, saved the great expense of trying metal molds and injection molding. Also we felt that there were several things yet to be tried.

We, the Plastic Optics Company (later renamed Armorlite), developed and patented a minimum-flow process in which we took discs of clear PMMA, turned them on a lathe into the lens form we wanted, and then polished them by pressing the blank between polished glass molds under moderate temperatures. As a consequence, we had superb, strain-free lenses with no problem of plastic memory or of striae. Their major limitation was susceptibility to abrasion. Nevertheless, since we were the only source of non-glass lenses in the nation, we developed a modest enterprise.

During World War II, the Columbia-Southern Chemical Company developed a new resin (Columbia Resin #39). Armorlite was producing lenses of methacrylate. We knew, from scientific reports, of the superior qualities of CR-39 but could not buy it because it was limited to military uses. However, I had sought access to it and they gave me small (five gallon) quantities for experimental purposes. By the time it was available commercially, we had worked out most of the techniques which enabled us to make excellent marketable lenses of CR-39. By marketable, I mean that the quality was good and the unit cost did not make the lenses prohibitively expensive.

With the end of the war, Columbia-Southern had large production facilities and tankcar quantities of CR-39, but suddenly had no use for them. Armorlite had a use for this redundant stuff. As the months and years went on, we became a pretty good consumer of material of which Columbia-Southern once had excessive quantities.

The chief problem in the manufacture of these lenses was the 14% shrinkage of the liquid monomer as it solidified between dies. This we accommodated by casting blanks with the appropriate front curvature and with a back curvature practically paralleling the front. This permitted uniform, distortion-free shrinkage during cure. We then ground and cold-polished on the back surface the curvature required to produce the desired power in the finished lens. From then on the use of plastic spectacle lenses accelerated, since the new product was some thirty times more resistant to abrasion than its PMMA predecessor.

For about the first six years we had a worldwide monopoly as the sole producers of CR-39 lenses. Then imitators began to enter the field, thus confirming the significance of our development. The manufacturers of glass lenses pointed out that our lenses were scratchable.

The one major way in which allyl resin lenses were not equal to or superior to those of glass was in their abrasion resistance. Even so, the use of resin lenses grew until it equaled, and in some countries exceeded, the use of glass. We constantly sought ways of improving the abrasion resistance and, through the years, tested and retested many approaches to improving the product.

Consistently, the surface treatment developed by the Minnesota Mining and Manufacturing Company (3M) proved superior to all others and I tried to license their process for use by Armorlite. Failing in that I tried to negotiate a license to manufacture the coating material itself. After years of negotiations, joint research and testing, 3M decided to acquire Armorlite. This was accomplished in 1978. On July 26, 1978, a letter was sent to each Armorlite shareholder informing them of the proposed merger with the Minnesota Mining and Manufacturing Company (3M), and calling for a meeting of the Armorlite shareholders at 10:00 A.M. on August 23, 1978 at the Armorlite Company offices in San Marcos for the purpose of approving the agreement under which they would receive \$414.18 per share. It pointed out that the earliest Armorlite investors had paid only \$1.00 per share, and that counting dividends and stock splits during thirty years under the terms of the agreement they would have received a total of \$4,164.88 per share, part of which would, of course, be in 3M stock, but which could be converted to cash if that were preferred.

This merger enabled 3M to market Armorlite lenses with improved abrasion resistance. With that development my contributions to the field of ophthalmic lenses ended.

Book Review: A Short Bright Flash: Augustin Fresnel and the Birth of the Modern Lighthouse

A Short Bright Flash: Augustin Fresnel and the Birth of the Modern Lighthouse. Theresa Levitt. New York: W.W. Norton, 2013. 281 pages. ISBN: 978-0-393-06879-5. Hardcover, \$25.95.

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Having used Fresnel lenses and Fresnel prisms on occasion, the subtitle of this book caught my attention as I had little knowledge of Fresnel's life or contributions. Augustin Fresnel was born in 1788 in the Normandy region of France. Entering École polytechnique in Paris at 16 years of age, his skill at graphic arts and engineering drawing stood out, "his dexterity and practical bent already marking him as an engineer." (p.26) He proceeded to École nationale des ponts et chaussées, a school of civil engineering, from which he graduated in 1809.

Fresnel's first job as an engineer was building roads. In 1819, Fresnel won the Grand Prize from the Académie des sciences for research on diffraction that he completed while on leave from his engineering job. His measurements of diffraction patterns corresponded closely to the predictions he made based on a wave theory of light.

Later in 1819, Fresnel was assigned to assist physicist Francois Arago in studies of the light output of lighthouses which at that time used parabolic mirrors behind oil lamps. These lights were not bright enough and shipwrecks were a major problem. To increase the light output, Fresnel designed a system of concentric lenses. Fresnel's system in 1820 had multiple polygonal lenses to make up each concentric ring. By 1821, the concentric rings were more circular as improved glassmaking allowed more arch in the individual pieces of glass in each ring. Fresnel and Arago also designed an improved lamp.

Tests of Fresnel's system in 1821 and 1822 showed it to be a much brighter light than those that were in lighthouses at the time. In 1822 and 1823, Fresnel also published a series of papers relating to the wave theory of light. In 1823, he was elected to the Académie des sciences, and in 1824, he was decorated with the Ordre national de la Légion d'honneur.

The first of Fresnel's lighthouse lighting systems was in use by 1823. Fresnel was promoted to secretary of the Lighthouse Commission. As he continued to work on improvements in the design and construction of his lighting system, he started to plan where lighthouses should be placed along the coast so that one light would always be visible, and he oversaw their installation.

Long in ill health, Fresnel died of tuberculosis at 39 years of age in 1827. Shortly before his death, he received the Rumford Medal from the British Royal Society for his contributions to science. Fresnel's brother, Léonor, also an engineer, had been assisting Fresnel and took over as secretary of the Lighthouse Commission.

The largest of the Fresnel lighthouse light systems incorporated concentric lenses along with prisms and mirrors to redirect light coming out of the lamp in many directions into parallel paths. At the Exposition Universelle of 1855, a bust of Fresnel was displayed and a Fresnel lighthouse lighting system was a prominent exhibit. By that time, sixteen different countries had installed the Fresnel systems.

The United States was slow in adopting the Fresnel lighthouse lighting systems. The emphasis of roughly the second half of the book was on struggles in the United States in the 1830s through the 1850s to improve the lighthouse system, the dismantling of the lights in the southern states during the Civil War to hamper the Union blockade effort, and rivalries among French and English companies making lighthouse lights in the late nineteenth century.

The last few pages of the book address the legacy of Augustin Fresnel. The items listed by the author as being byproducts of the principles of Fresnel's lighthouse light system have been stage lights, stop lights, car headlights, overhead projectors, solar generators, and "handheld sheet magnifying glasses." (p. 232) The author did not specifically mention the application of Fresnel lenses and prisms to spectacle lenses.

The author closed the book with these thoughts: "The most brilliant physicist of his age, he abandoned his research to devote himself to the cause of illuminating the coast. Although he was small, delicate, and hampered by sickness, the strengths he possessed were his mind and spirit, and these were enough to take on one of the civilization's most indomitable opponents: the sea. The brighter lights emanating from his lenses were one of the few human efforts to reduce the terrible risks facing every sea voyage. It is only fitting, then, that as every lighthouse in France came to have a Fresnel lens in the nineteenth century, so too did they all have bust of Fresnel, his high, pale brow surveying the shoreline that he had made a little safer." (p. 233)

In the preface, the author described herself as a historian of optics. She is a history professor at the University of Mississippi. She graduated from the Massachusetts Institute of Technology and holds a master's degree in history from Iowa State University and a Ph.D. from Harvard University. I found the book to be interesting reading, and I was pleased to learn something about the life of Augustin Fresnel. The book includes 29 pages of bibliographical notes, an index, and a number of black and white illustrations.

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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.

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