

NEWSLETTER
OF THE
OPTOMETRIC HISTORICAL SOCIETY

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AOA File

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None volunteered:

Quite in contrast with the high count of eight nominations for Jim Leeds last year, no one this year volunteered or suggested a replacement for Jim Tumblin, whose term ends this year and who chooses not to run again for reasons of increased personal involvements and responsibilities heaped upon him otherwise.

At Dr. Leeds' behest I listed about 10 OHS members whom I knew to be genuinely interested from their actions, letters, calls, and contributions. President Leeds then went into caucus with other members of the OHS Executive Board to name a couple of candidates from which you are to select one, or write in your own nominee. The ballot is enclosed. Please vote.

A whim can be a whammy:

The following four paragraphs are taken verbatim from the August 1983 issue of the Indiana History Bulletin, Vol. 56, No. 8, page 125:

Help is on the way to more than 81,000 political subdivisions in the United States struggling to protect vital local government records from the ravages of time, neglect and the elements.

The National Historical Publications and Records Commission has awarded the American Association for State and Local History a \$145,000 grant to assist local governments in preserving documents essential not only to the everyday work of government itself, but also to the work of historians and other researchers.

The financial burden of records management at the local level is staggering. The annual cost of state and local government paperwork in the United States may be as high as \$500 per person. But only a handful of local governments have recognized that good records management can result in substantial savings. For example, using high-density records centers can cut the annual cost of merely storing the contents of one file cabinet by up to 90 percent.

Economic considerations pale in comparison to the threat current conditions pose to preserving government records. Many essential government documents sit deteriorating in damp basements or scorching attics. Many others have already been destroyed by fires and floods that struck poorly constructed and inadequately protected storage facilities.

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INDIANA UNIVERSITY

Government records have at least the protection of law against totally arbitrary destruction. This is not the case with the records of professional organizations. All too often, if not almost always, the disposal of old records and documents of optometric societies are at the whim of a single individual, a volunteer officer, an executive employee, or even a transient clerk. Like the proverbial weak link in a chain, a momentary whim can destroy forever records that may have been conscientiously preserved through a lifetime or longer. Unlike the broken chain, an archival loss cannot be restored.

Obviously, this world is a bit too crowded to save everything. Professional selection judgement is crucial to each decision. Each of us, however, can play an important role by occasionally inquiring about policies and controls in effect among those currently responsible for the records and documents in the various optometric societies to which we belong.

I recall quite painfully my shock of many years ago when, upon being elected to the presidency of a small but significant national organization of some twenty years prior existence, I wrote my predecessor to request that he forward his official organization files to me. His incredulous response was, "What files?".

He had not saved a single letter or memorandum, and he doubted that any of his predecessors had! Now I wonder what my successor and his successors may have done with the files I forwarded. Those records too may be victims of a whim.

Contact lens oral history:

Dr. Henry A. Knoll, Senior Scientist at Bausch & Lomb, Rochester, New York, wrote us the following:

Having read your definition of oral history, I write at this time to enter in the Newsletter two oral histories which I have recorded.

On June 12, 1974 I recorded a conversation with Gil Sheldon. Gil was a Technician here at B&L who fabricated our first attempt at contact lenses just prior to World War II. The scleral lenses had glass corneal portions and plastic scleral flanges. Several trial sets were fabricated and sent out for testing. At the outbreak of war, the trial sets were recalled and never used. I have a set of the lenses in my office.

On August 31, 1983 I recorded a conversation with Leo Waldert. Leo is a local optician who fitted the first contact lenses in Rochester. He is now 75 years old. His son Bill carries on the business--third generation. The first lenses fitted were obtained from Zeiss. One pair of lenses were destroyed enroute in the Hindenburg disaster. As you may recall the zeppelin Hindenburg burned during landing operations at Lakehurst, New Jersey on May 6, 1937.

As time permits other oral histories will be recorded. Will the Society act as a depository for these tapes? I think this would be a useful service to present and future historians. The tapes would be an excellent research resource.

I will be happy to contribute my tapes.

I have informed Dr. Knoll that the Optometric Historical Society itself does not serve as a repository for items of historical and archival interest. Rather, it encourages the support of museums, libraries, and archives already established to do so. Very highly recommended in the U.S.A. is ILAMO, the International Library, Archives, and Museum of Optometry, Inc., which has the facilities and professional staff to handle and preserve such items properly. Items received by me for assignment are almost routinely forwarded to ILAMO, occasionally to other archival centers which may seem more appropriate.

Fifty years of continuing education:

Fifty annual congresses, the first in Greenville, South Carolina, in 1924, and the fiftieth in Atlanta, Georgia, in 1973, provide the skeleton of a chronological account published circa 1973 by the Southern Council of Optometrists. Entitled "A Triumph for Professional Pride: A History of the Southern Council of Optometrists and its Woman's Auxiliary," it consists of 58 pages of text written in something of the style of concise minutes of meetings. In this very documentary form it identifies the key persons, activities, projects, events, and organizational and educational developments in the American states variously referred to as "The South," "Dixie," or "Dixie Land," approximating the area of the former Confederate States of America.

Special credit is given to Archie A. Odom, O.D., (1888-1949) of Greenville for conceiving the idea of an educational congress for the Southeastern states, and to his associate Adolph H. Schade, O.D. (1865-1946). They each served the profession in several roles, and together they made the first Congress an overwhelming success. Among the numerous individuals given credit for assisting in the preparation of the material for the publication itself the late Dr. Wm. C. Ezell and Mrs. Ezell clearly stand out.

Collectors club very active:

The Ophthalmic Antiques Collectors Club, described on pages 2 and 3 of the January 1983 issue of the NOHS, Vol. 14, No. 1, has issued its fourth quarterly newsletter, entitled The Bulletin, dated July 1983. That issue included extracts of a letter from the Ironbridge Gorge Museum requesting assistance in its construction of a "Victorian Chemists and Optician's Shop." The same issue included a history, by Margaret Mitchell, of spy or "prospect" glasses so popular from about 1750 to 1850. She listed and briefly described 14 spy glasses and the prices they fetched at a recent sale.

Techniques for restoring old spectacle cases are described in another article, and the invention of "pantosopic" spectacles by George Richard Elkington in 1834 is detailed in still another.

The organizer of the club, Mr. D.C. Davidson, Northall Cottage, East Chiltonton, Nr. Lewes BN7 3QS, England, invites interested persons to join. The local dues are £ 3, overseas dues £ 4.

Stellar Astronomy: Historical Studies:

This is the title of a paperback by Michael Hoskin published in Bucks, England in 1982 by Science History Publications, Ltd. It was reviewed in the July 1983 issue of Sky and Telescope, pp. 31-34, by George O. Abell of the University of California, Los Angeles. Much of astronomical history is of course optical history. The following paragraph from Abell's review must strike a specially resounding chord for OHS members:

"The Division for Historical Astronomy of the American Astronomical Society now has some 300 members. It is not because there are that many historians in the society, but because of the growing interest in the history of science within the astronomical community. And with this I concur. The more we study our history the less likely we are to lose our perspective and reinvent the astronomical wheel."

Fleeting fame:

Recently O.H.S. Secretary-Treasurer Maria Dablemont sent me photocopies of a series of three articles entitled "Famous Optical Men Whom I Have Met" by T. Haines Moore. She did not explain why, so I merely conjecture that she came across them quite serendipitously and wondered if I might find them as fascinating, or puzzling, as she did.

I did.

Each article included a portrait photograph of Moore himself and the subheading, "Written exclusively for The Optical Journal and Review of Optometry, all rights reserved." They appeared in the September 18, 25, and October 2, 1919, issues, Vol. 44, Nos. 13, 14, & 15, pp. 925-926, 1007-1008, and 1071-1072, respectively.

The first dealt with Ivan Fox, who was born in 1852 in Russia and came to the U.S.A. at age 19 and eventually opened an optical store in Philadelphia. Among other things, Moore credited Fox with the invention of the "Fox Offset guard, . . . probably one of the greatest boons to the eyeglass wearing public that has ever been invented--this guard with pads and arms of different angles and lengths."

The second dealt with an optometrist named Dudley L. Tice who was born in Westfield, Massachusetts, in 1858, worked successively for several optical firms, including that of Ivan Fox, and eventually studied optometry at the Philadelphia Optical College. Dr. Tice's special fame lay in his skill of "frame adjusting and fitting." At "bridge-bending" he was hailed by one authority as "the best man in that line that I have ever met."

The third subject of fame was Anton Wagner, who was born in Munich, Germany, in 1851 and arrived in America in 1883. He is credited with making the first toric lens ever made in the United States and for "making their manufacture a practical and commercial proposition."

Dr. Moore, himself a Philadelphia optometrist, wrote many short articles for the journal, almost one per week in some years, on a wide variety of topics, essentially as a columnist. In the 1918 Blue Book of Optometrists he identified himself as an 1899 graduate of the Philadelphia Optical College and as having done postgraduate study in "The College of Human Knocks."

What his casually considered three journal items reveal are the separate impacts of a spectacle pad arm, of a toric lens, and of the art of bridge adjusting on the professional development of optometry. In a kind of way these three simple components of today's optometric armamentarium are quite analogous to frequently cited inventions, discoveries, and techniques in other fields. A few led to complete revamping of surgery, engineering, agriculture, and even pedagogy, for example. The hypodermic needle and the silicone chip had major impacts familiar to all of us, but hundreds of equally elementary designs gave rise to revisions of career styles that are now almost forgotten, as are their inventors and developers. Who, for example, invented the once ubiquitous slide rule!

More on Faraday:

The following is a recent letter from D.C. Davidson of the Ophthalmic Antiques Collectors Club:

"I was interested to see reference to Michael Faraday in the April issue of the 'Newsletter' just received as they supplement my meagre notes which are as follows--

"Son of a blacksmith, apprenticed to a bookbinder.

"Was assistant to Sir Humphrey Davey when in 1814 they used the Bregens lens as a burning glass in an experiment to burn a diamond.

"Undertook experiments in 1824 on behalf of the Royal Society in conjunction with Sir John Herschel and G. Dollond to improve the quality of glass for telescopes. Is said to have remarked that the best way to improve glass would be to remove the tax on it.

"Michael Faraday suffered an almost complete loss of memory and other more recent members of the family suffered from the same affliction.

"Yours sincerely

Derek C. Davidson

"(A Faraday cousin with a rather poor memory)!!"

Pre 1900 American optometry:

In a review of the genealogy of the periodical now known as Chilton's Review of Optometry in the April 1978 issue of N.O.H.S., Vol. 9, No. 2, pp. 20-21, I mentioned Jewelers' Circular, The Optician, and The Optical Journal as publications which to a significant extent served as American optometrists' principal mass communications for a few years prior to 1900. Another such journal which was not part of the genealogy was The Keystone. It was a monthly publication "devoted to the interests of the watch, jewelry, and optical trades". ILAMO has only the March 1892 issue (Vol. 13, No. 3) and the January 1894 issue (Vol. 15, No. 1). According to the 1965 Union List of Serials, the Minnesota Historical Society library in St. Paul has volumes 10 to 18, and the U.S. Interstate Commerce Commission Library has volumes 12 to 62.

Where might volumes 1 to 9 be?

Another serial serving a parallel role was Jewelers' Circular, briefly mentioned in the above cited pages of N.O.H.S. as carrying some optical news. According to the 1965 Union List of Serials it first appeared in 1869 and reached volume 105 at its termination date sixty-five years later in December 1934. The incongruence of the volume numbers and years is not explained, but it can reasonably be guessed that at least the first 31 volumes would have preceded the turn of the century. A notation on the ILAMO holding card for Jewelers' Circular (Weekly) "Optical Department," indicates that the Feb. 6, 1901, issue was in volume 42. The Union List of Serials shows part of vol. 2 at the American Antiquarian Society, Worcester, Massachusetts; volume 9 and parts of volumes 5, 8, and 28 at the New York Public Library; volume 15 and parts of volumes 16, 17, 21, & 25 at Yale University; and volumes 25+ at the U.S. Library of Congress.

ILAMO has no issues prior to 1903.

A fourth late nineteenth century American periodical which included the voice of optometry was the Optician and Jeweler, published in New York from January 1891 to April 1892 as Optician, May to September 1892 as Optician and Allied Interests, and finally as Optician and Jeweler until sometime in 1894, altogether a total of 43 issues. According to the 1965 Union List of Serials the only known holdings are at the College of Physicians of Philadelphia, which has parts of vols. 1, 2, and 3 and all of 4 and 5.

The aforementioned earliest issues of the current Chilton's Review of Optometry, the Optical Journal, started in March 1895. ILAMO has complete holdings of the pre-1900 issues.

Without even trying to focus clearly on the apparent emergent pattern of serialized optometric literature one must realize from the above that the published communications of American optometry prior to about 1900 were quite incidental to those of the jewelry trade. Yet we know that at the turn of the century there were twenty thousand optometrists of all adult ages in America ready to be registered when the appropriate laws were enacted. Thousands also had formed organizations to demand exclusive registration laws when they perceived threats that they might be registered under medical board surveillance. In other words, optometrists were already here in numbers approximating today's optometric population in a total American population of much less than half our current population.

What seems to be needed for a better understanding of our American optometric origins, recognizably different from those of the old world, is a scholarly search of the aforementioned jewelry-related literature, widely strewn or abandoned as it may be. Perhaps with microfilm and microfiche technology copies of the known holdings could be brought together in one center, such as

ILAMO, for perusal at least by history buffs if not scholars.

Indeed, the history of American optometry prior to 1900 is presently something of a "dark age".

Plastic spectacle lenses:

Only twice has this newsletter made historical reference to plastic spectacle lenses (Vol. 8, No. 3, July 1977, p. 44 and No. 4, October 1977, p. 72). Nevertheless they have been around longer than many living optometrists. OHS member Robert Graham, O.D., now reminds us that "How it all started--the story of Armorlite" by E.J. Crundall appeared in the January 1980 issue of Manufacturing Optics International, Vol 33, No. 1, pp. 32-33. To supplement these tidbits Dr. Graham has kindly prepared a brief history of his own involvement, as he was undoubtedly the key person in the successful development of plastic spectacle lenses. His account follows:

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

This is inevitably semi-biographical. At the time I was graduated from The Ohio State University in Applied Optics, I was offered a position by the Bausch & Lomb Optical Company. Since this involved additional training, with pay, I accepted. My three years with Bausch & Lomb gave me some background in optical manufacturing.

The Univis Lens Company had acquired The Unbreakable Lens Company of America (TULCA), which had attempted to make ophthalmic lenses of polymethylmethacrylate (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 become a supplier of ophthalmic lenses.)

A few months after my visit Univis offered me a position as their Western 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 and 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 brief. Furthermore, injection invites striae. Univis never reached a point where they could enter the market with their product.

I was by then Sales Manager of Univis and 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.) 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 expense of trying metal molds and injection molding.

We, the Plastic Optics Company (later to be known as Armorlite, a name I subsequently devised), developed and patented a minimum-flow process in which we took discs of clear PMMA, turned them on a lathe into the lens forms 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 modestly successful enterprise. Then, at the end of World War II, a new and superior plastic monomer became commercially available. This was allyl diglycol carbonate (CR-39). Within a year and a half after its availability Armorlite had devised ways of producing marketable lenses of this new resin. By marketable I mean that the quality was good and the unit cost did not make the lenses prohibitively expensive.

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. 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.

In the course of years we introduced the first colorless ultraviolet-absorbing lenses (I dissolved American Cyanamid's UV-9 in the liquid monomer); uniform tints (accomplished by impregnation of the finished lenses with dyes in a hot bath) and an increasing range of powers, sizes, forms and constructions.

Technical and financial limitations held our growth to about 25% increase each year. This growth rate we maintained for many years.

For about six years we had a world-wide monopoly as the sole producers of CR-39 lenses. Then other manufacturers began to enter the field, thus confirming the significance of our development.

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 negotiation, joint research and testing, 3M decided to acquire Armorlite. This was accomplished in 1978. They then could bring to the market Armorlite lenses with improved abrasion resistance. With that development direct optometric contribution to the field of hard resin ophthalmic lenses ended.

Received by ILAMO:

Following are the names of those who have donated books, audio-visuals, periodicals, museum items, and archival materials to the International Library, Archives, and Museum of Optometry during the period of June 1, 1982 through June 21, 1983:

Professor B. L. Cole	Allan E. Kosh
Mr. Robert H. Collins	Harold E. Magnan, Jr., O.D.
M. W. Coon, O.D.	Eric P. Muth
Norman J. Drew, O.D.	Wade W. Nyquist, O.D.
Kenneth C. Edberg, O.D.	B. B. Parks, O.D.
H. Ward Ewalt, O.D.	Donald Pitts, O.D., Ph.D.
Roberta Lynn Fitscher	Mrs. Henry Quick
Lyle E. Hedrick	Elias Shaneson, O.D.
Henry W Hofstetter, O.D., Ph.D.	Boykin Baird Smith, O.D.

Bernard C. Jander, O.D.	Societa Italiana Di Optometria
Sidney B. Katz, O.D.	Jacob Staiman, O.D.
Robert A. Koetting, O.D.	John N. Sugg, O.D.
Dorothy Weitzner Kornblut, O.D.	J. Ottis White, O.D.

Early orthokeratology?

The March 1983 issue of Pharmaceutical Historian, the Newsletter of the British Society for the History of Pharmacy, Vol. 13, No. 1, pp. 2-3, has a well written and illustrated article entitled "Sight Improvers and Eye Massagers" by W.A. Jackson. We are told that a Dr. Ball first patented his "Eye Cups" in the U.S.A. in 1851. In use, some air was squeezed from a rubber ball which, upon release, provided negative air pressure in the cup applied to the eye (with the eyelid closed). The reduced air pressure was said to "cause a proper amount of blood to flow through the eye, and restore the diminished convexity of the cornea."

Various refinements and model changes were patented in 1865, 1869, February, March, April, and May of 1899, 1911, and 1931, variously in the U.S.A., Great Britain, and Canada, by inventors who included besides Dr. Ball a hydraulic engineer, a "Mechano-Therapeutist," and others whose professions were not identified. The product names included "Eye Cups," "Ideal Sight Restorer," "Neu-Vita Eye Masseur," and "New-Vita Oculizer," all illustrated in the article. Some of the inventions also provided for the options of increased air pressure and massage.

The author gives credit to the Wellcome Library (unknown to me) for the opportunity to examine the various instruments. He adds that he was sufficiently curious to use the "Oculizer" himself on one occasion and "suffered appreciable discomfort for some hours afterwards."

OHS President Leeds, who sent me the article, reports that he has in his collection an "Ideal Sight Restorer" with its accompanying manual, and another model of unknown make.

For information on another variety of instrument for similar purposes see "Sight Restoring, 1865" in the April 1975 issue of N.O.H.S., Vol. 6, No. 2, p. 22

Support from New Jersey:

Thanks to Norbert Kastner, O.D., editor of the awards-winning newsletter Focal Points, for citing the N.O.H.S. in his June 1983 issue, page 9, in combination with a friendly plug. Indeed, we want everyone with even a wisp of interest in optometry's history to join us in our efforts.

History mills grind slowly too:

In the September 20, 1920, issue of the Optical Journal and Review of Optometry, Vol. 46, No. 14, page 933, W.V. Nicum, then Secretary of the American Optometric Association, made a vigorous appeal to his co-workers. The following are three selected paragraphs therefrom:

The American Optometric Association has been in existence less than 24 years, with a membership of only about 7,000 out of thousands and thousands of optometrists in the United States and the great Dominion of Canada. This deplorable condition is all wrong and enough to make us hang our heads in shame.

It seems to me in 24 years we should have aroused a greater proportion than only 30 per cent of the optometrists in the United States and Canada, to realize their duty to their profession by supporting organized optometry.

If the history of optometry during the last 24 years can be used as a fair criterion, we can reasonably expect to have a complete organization when the profession of optometry has gone over into the 21st century and the present day optometrists have been long dead and forgotten. But we are not going to permit such a calamity to happen, we are not going to permit optometry to record such a history. We are all going to get busy now, not tomorrow, but now, as one big family and lay plans, solid and sure, and begin now the round-up of this great majority of optometrists and get them into the organizations. Ye Gods! my fellow officers, let us begin now to build up organized optometry in this fiscal year 1920 and 1921, and not string it out through the remainder of this century.

Indeed, we are still stringing it out, with only 16 years left.

Japanese eyeglass industry history:

Professor Tatsuzo Ueda of the Faculty of Sociology of Kansai University, Osaka, Japan, prepared a paper entitled "The Development of the Eyeglass Industry in Japan." It was published by the United Nations University in 1979 as a working paper "prepared within the framework and as part of the Project on Technology Transfer, Transformation, and Development: The Japanese Experience of the United Nations University's Human and Social Development Programme." A printed copy of the 50 page document is on file at ILAMO.

The eyeglass industry in Japan is classified as one of the eighty or more sundry goods industries so identified by seven or more characteristics. The author's brief introductory commentary on the sundry goods industries deals with developments in the Tokugawa Period (1603-1867), the Meiji Restoration (1867-1912), and the post-Meiji era. The eyeglass industry is declared to be "a very typical sundry goods industry in that it has developed with most of the characteristics of such industries. . .". Statistics on eyeglass production, exports, and imports are included for the period 1958-1975 as derived from various agency sources. In 1975, for example, Japan produced ¥73,572 million (ca. \$300 million dollars) worth of eyeglass products, exported ¥14,953 million worth, and imported ¥12,518 million worth. During the almost tenfold production increase between 1965 and 1975 exports declined percentage-wise, and imports increased almost to parity.

Chapter IV deals specifically with the history of the Japanese eyeglass industry, as follows:

(1) Pre-Meiji Period

The first reported appearance of eyeglasses in Japan is the presentation of a pair to Yoshitake Ohuchi by a Roman Catholic missionary sometime in the 1530's during the reign of Emperor Gonara, and the oldest ones still in existence are the two pair on display at Toshogu Temple that belonged to Ieyasu Tokugawa.

It was not until 1628, however, that the Japanese learned how to manufacture them when Yahee Hamada of Nagasaki passed on to a friend what he had been taught in this respect by a European. This manufacturing technique subsequently made its way from Nagasaki to Osaka and from there on to Kyoto and as far as Edo. It was hardly used, however, until the end of the Tokugawa Period because of the overwhelming advantage held by imported products. In those days the lenses made in Japan were mostly crystal, glass lenses being made only by processing "blue plate" glass imported from Holland.

It was not until after the Meiji Restoration that eyeglass manufacturing in Japan became an industry based on scientific technology.

(2) Background of Establishment of the Eyeglass Industry

In 1873 Matsugoro Asakura sailed to Europe to attend the International Exposition in Vienna with the mission of learning what he could about the latest eyeglass manufacturing techniques, and the following year he returned to Japan with some eyeglass manufacturing equipment.

In those days the grinding and polishing of lenses in Tokyo, Osaka, Nagasaki, and elsewhere was done by hand, and it took 5-6 days to finish a single lens. Moreover, it was difficult to achieve exactly the desired lens strength.

With the equipment brought back by Asakura, though, it became possible for one man to complete 52 pairs of lenses in a single day and with uniformity of lens strength, which represented a revolution in terms of both quality and price. Unfortunately, however, this development came to nothing owing to the fact that Asakura passed away suddenly two years later while building a factory in which he was to put to use the equipment in question and accessory tools that he had borrowed from the government.

Let us take a look now at how the lens manufacturing in the Tajima area of Ikuno Ward, Osaka, got started.

In the Meiji Period the Tajima area was a pure rural village in the Settsu grain belt which also had long produced Kawachi cotton, grown on one-third of its cultivated acreage. In fact, there had already developed a considerable amount of cultivation of market crops in many areas outside of Osaka. Unable to compete with imported foreign cotton, however, this local cotton began to be cultivated less about 1889, and by the end of the Meiji Period such cultivation disappeared entirely.

Earlier, at the end of the Tokugawa Period, there was a farmer in the Tajima area by the name of Tajiro Ishida. Not being able to engage in agriculture because of an injury to his right foot that he had suffered in his childhood, he began instead to manufacture eyeglasses locally after learning the necessary techniques. That was back in 1857, the date that marks the beginning of Tajima eyeglass manufacturing. In those days eyeglass manufacturing techniques were very primitive, with lenses being ground and polished one by one in the bottom of a pot. Furthermore, since there was not much demand for eyeglasses, there were still only two or three manufacturers as late as 1877.

Later on, however, with the waning of cotton cultivation, the Tajima area developed a labor surplus, and it just so happened that the eyeglass manufacturing industry was beginning to develop as demand at last began to grow and was therefore able to absorb this surplus labor as a means of increasing the scale of operations and bringing more cash income to the area. Thus, by the end of the Meiji Period there were already ten-odd well-known eyeglass factories in

the area, some training their own workers and others hiring those who had already become skilled in eyeglass manufacturing techniques. Many of them, however, were only side businesses of independent or tenant farmers that they ran at times of the year when agricultural work was slack, and even the more well-known ones were no more than cottage industries under the control of Osaka wholesalers. Since the manufacturing techniques employed in those days were still rather primitive, the market for higher quality products was monopolised by imports from Europe and particularly Germany.

As for the materials used, about 1877 the emery, colcothar, pitch, woollen cloth and some other necessary materials were produced at home, but the all-important glass was entirely imported as top-grade plate. This thick plate glass was too expensive to use directly, so lens makers were always looking for damaged plates that they could buy much cheaper. Eyeglass lens plate glass began to be imported in 1888, after which it was used exclusively in lens manufacturing, and it was not until the Taisho Period, which began in 1912, that such glass came to be manufactured regularly in Japan.

(3) Development of the Industry During and After the First World War

With the outbreak of the First World War, imports of eyeglass lenses and the glass for making such lenses were cut off, making it possible for Japan's own eyeglass lens manufacturers to achieve rapid development and begin to produce rather superior products in technological terms. Furthermore, around 1921 three lens glass manufacturing factories were set up in Tajima-cho.

In the meantime Osaka City was gradually expanding to the east, and Tajima, too, was incorporated into it in 1925. Having then lost all of its farmland, the Tajima area became increasingly one of people specializing in the manufacture of eyeglass lenses. By 1929 there were several hundred such manufacturers in and around Tajima, producing a total of 250,000 dozen lenses annually and even exporting some of this production to India and China.

With the introduction of electric motors in the 1920's, the traditional hand grinding gave way to grinding machines, which boosted production capacity enormously, and this resulted in a big increase in the percentage of production exported. In 1937 and 1938 60-70% of corrective lens production and more than half of sunglass production was exported to China, Southeast Asia, and the United States.

Thus, before the Second World War the Japanese eyeglass lens manufacturing industry enjoyed a period of unprecedented prosperity, but as the international situation grew tense around 1941, lens glass came into short supply, and after the outbreak of war in the Pacific and the cutting off of imports of good lens glass, this shortage became still more acute. There were plans to produce glass comparable to the German lens plate glass that had been imported up to then, but all sorts of constraints kept them from materialising. Since, however, demand for eyeglass lenses did not decline very much, the only recourse was to use ordinary thick plate glass. As the war situation worsened, many eyeglass manufacturers went off to war, and with such additional difficulties as shortages of electricity and lens materials, many eyeglass factories had to close down. That is how things stood at the end of the war in August 1945.

The other centre of lens manufacturing in Osaka Prefecture, Kishiwada City, got started back when Yasutaro Morita settled down there after learning the necessary techniques of lens manufacturing from Kametaro Asakura, who carried on the enterprise his father was initiating in Tokyo at the time of his death at the end of the Meiji Period. Morita had 5-6 young apprentices from farm families in the Shimomatsu-cho area of Kishiwada, one of whom, Sotaro Iwabashi, set up his own lens factory in Shimomatsu-cho around 1921. Two or three years later this factory became bankrupt after the wholesaler that had been buying its lenses repeatedly returned inferior-quality lots, but it was soon taken over by the Isojiro Kai Store, an Osaka eyeglass processing business, and production was resumed, this time with twenty journeymen, including sons of farmers in the area. In 1931 however, the business failed again and for the same reason. Having lost their jobs, some of the journeymen went back to farming, but others remained in the eyeglass industry in Osaka and Nagoya. The Nakano brothers and a certain Nishita, both local men, started up a lens manufacturing business in Shimomatsu-cho again around 1935, and before the war the Shimomatsu area came to boast seven lens factories.

These were the histories of the formation of local groups of lens manufacturers in the Osaka area. In the Tajima area lens manufacturing began in the Meiji Period as a part-time side business of farmers. Later it developed as very small rural enterprises on the outskirts of Osaka, and after the First World War it further developed into urban industries, although still small in scale, as the area became urbanized, largely on the basis of the cheap labour furnished by Korean workers, who were available in large numbers. In the Kishiwada area, on the other hand, lens manufacturing developed as family businesses at home that got started when farmers' sons learned the necessary techniques.

(4) Since World War II

Before the war, Japanese lens production reached its peak about 1937, when there were 170-180 manufacturers of corrective lenses in the Osaka area and about 40 in the Tokyo area and Japanese lens exports monopolized the East Asian market, totalling 1.3 million dozen, for a value of ¥3,240,000, in that year.

Although the corrective lens manufacturers in the Osaka area suffered little war damage and most of their equipment and facilities were still intact, until about the middle of 1947 they were not able to produce at more than about half of their prewar level because most of their factories had been shut down during the war. Domestic demand grew by the month, but exports had not even recovered to 40,000 dozen by 1948 because of the loss of the enormous market of the Chinese Mainland. Furthermore, up till about 1949 there was only enough imported lens plate glass to meet domestic demand, particularly in view of the shortage of electricity.

By 1950, however, the number of manufacturers reached its former level as demand increased in Southeast Asia, Africa, and the United States, and thereafter exports increased year by year, reaching 580,000 dozen in 1952, 860,000 dozen in 1953, and 1.4 million dozen in 1954, or more than the prewar peak. Exports continued to increase steadily in the following years, and the increase in demand attracted new entries into the industry. This resulted, however, in excessive competition, a fall in export unit prices, and a lowering of product quality. Although no other country yet presented itself as a serious competitor to Japanese lens exports, the downtrend in quality can be explained by the fact that it was necessary to "produce to the going price" as buyers in Southeast Asia and Africa, where demand was naturally for cheap lenses, beat down prices still further whenever transactions became regular.

In order to cope with this situation, the Japan Association of Eyeglass Product Exporting Industries was organized in 1960 and began to restrict export quantities of corrective lenses in 1962 and of sunglasses in 1963, such restriction continuing until 1968.

In 1964 a joint venture was started by the United States firm A.O.C. and a Japanese watch manufacturer for the production of double focus lenses in Osaka and three other areas. Then in 1968 the first joint factory of the lens manufacturing industry in Osaka was built in east Osaka as a project for upgrading smaller enterprises that was undertaken jointly by the Osaka Prefectural Government and the Agency for the Promotion

of Smaller Enterprises. It became the premises of the Japan Eyeglass Industry Centre, a cooperative association of the industry.

As for the situation with respect to supply and demand and exports since then, it has already been discussed in Chapter 3.

Optometric ephemerae:

Miss Elizabeth-Ann Colville, 10 Steele's Road, London NW3, 4SE, England, a free lance journalist cited in our April NOHS, writes, "I have a carte de visite on the reverse of which is 'William Heath of Plymouth optician to the Royal Eye Infirmary; Opera glasses, telescopes etc. maker of Nautical and mathematical instruments . . . as well as employing Mr. Ballingham as photographer.' I also have three copies of our Consumers' Association publication 'Which?', 1) 1969 Feb. relating to SPECTACLES, specifically to our National Health Service, the types then available (frames), costs, etc. 2) 1971 Oct. CONTACT LENSES, 6 page article with a chart comparing a dozen opticians and two bar charts on the advantages and problems. 3) 1971 June CONTACT LENSES--five page article on types, problems, costs, after care, and summary, etc. Any interest to any of your members?"

She reports picking up things like these at the Bazaars of the Ephemera Society in London every six weeks.

A new member in Mainland China:

Recently J. J. Abrams, O.D., member of the O.H.S. Executive Board, joined an optometric tour of the People's Republic of China. Among the receiving hosts was Xie-Can Wu, M.D., of the Eye Department, The First Affiliated Hospital, Zhejiang Medical University, Hangzhou, Zhejiang (Hangchow, Province of Chekiang). Drs. Abrams and Wu seem to have struck up a warm friendship, which was then firmed up a bit more by a gift membership in the O.H.S. from Dr. Abrams to Dr. Wu. This then prompted a July 9 thank-you letter, in English, to Dr. Abrams from Dr. Wu, as follows:

"I have received a letter and a copy of the OHS newsletter from Mrs. Maria Dablemont, the secretary of OHS. She told me that you have introduced me to be a member in the Optometric Historical Society and subscribed the newsletter for me. Thanks very much."

"As you know I am a Chinese eye doctor and know nothing about the optometric condition in your country. Would you please tell me something about the OHS and let me know what's the aim and the situation of this society?"

"I am the Chairman of The Zhejiang Ophthalmologic Association and the editor of "Chinese Journal of Optometry". I hope you can write something for our journal. We will publish it as soon as possible."

"Thank you again for your kindness."

Dr. Wu's identification with the Chinese journal of "Optometry" is doubtlessly a translation error, for Dr. Abrams points out that he "had never seen the word 'optometry' in all of China". Dr. Wu must have meant to say the Chinese Journal of Ophthalmology.

Our attempt to track down that journal through conventional library resources elicited only the information that volume 1 of the Chung-Hua Yen K'o Tsa Chih (Chinese Journal of Ophthalmology) appeared in 1951 but was suspended with volume 12, no. 4, in 1965. It had been published in Peking, a thousand miles north of Hangchow.

Other new OHS members:

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Thanks, Claro:

Claro M. Cinco, O.D., of Cebu City, The Philippines, included a \$20.00 donation with his 1983 dues.

Fick practiced in South Africa:

Henry Knoll calls our attention to an unusually well documented article on the role of Dr. Adolf Eugen Fick (1852-1937) in the invention, or at least early application, of contact lenses. The article is by Wilfried Jürgen Schmidt in the South African Optometrist, Vol. 42, No. 3, June 1983, pp. 77, 81, and 83.

Fick was born in Germany, educated in medicine and ophthalmology, and had hoped for an appointment in physiology at the University of Cordoba, Argentina, in 1878. Disappointed in that hope he decided "to emigrate to the boers in South Africa," arriving in Cape Town by boat on July 25, 1879, where he was registered by the South African authorities as a physician, surgeon, and "verloskundige" (obstetrician). Influenced by friends he made aboard ship he settled in the little town of Richmond (population 996) in the arid tableland of southcentral South Africa called the Karroo. He hoped there also to cure his tuberculosis, which he apparently accomplished.

His announcement of the opening of practice in the August 9, 1879, issue The Era, Britstown Advertiser and Government Gazette for Richmond and Hanover Divisions, read as follows, "Dr. Fick M.D. Physician, Surgeon, Accoucheur [male midwife] and Oculist, (Late Assistant surgeon in the Hospital for Diseases of the eye in the University of Breslau, Germany) Begs to inform the public, that he has commenced the practice of his profession in Richmond. Upon receipt of his luggage from Port Elizabeth containing his instruments, operations can be performed.--Residence, Market Square, in the house lately occupied by Dr. Jones."

In 1884 at the age of 32 years, he revisited Germany to get married. In 1886, a much wealthier person as a result of a very lucrative practice, he and his wife and son returned to Europe where he settled in Zürich, Switzerland, as an ophthalmologist. There he conducted his investigations into contact lenses and published his first findings in September 1887.

Among the numerous other details, author Schmidt gives an account of the controversy that raged during Fick's lifetime as to who invented the contacted lens.

To be believed?

On May 8 of 1956 Ripley's Believe It Or Not cartoon featured Sir Sandford Fleming (1827-1915) as "THE COLOR-BLIND PAINTER," identifying him as a "Canadian engineer and artist" who "PAINTED LANDSCAPES IN GLOWING HUES--YET HE WAS TOTALLY COLOR BLIND."

Two encyclopediae that I consulted gave substantial write-ups of Sir Sandford's accomplishments, but neither mentioned his paintings or his color vision. Robert LeRoy Ripley (1893-1949) could hardly have known him personally, so, apparently, the information must be recorded elsewhere in the literature.

Who was L. Matthiessen?

In the review of an article by John Levene in the April 1983 issue of NOHS, Vol. 14, No. 2, p. 24, mention was made of L. Matthiessen. Levene had pointed out that, according to Sheard, Matthiesson (1830-1906) derived a simple, approximate formula for estimating the refractive index of the crystalline lens, as follows: $N_{total} = 2 - n_1$, where n_1 represents the central refractive index and n_2 refers to the peripheral refractive index. Sheard called it Matthiessen's Law, but cited no reference.

A personal inquiry to Dr. Levene and a routine search of several published biographical directories with the help of a reference librarian has netted no clue as to the identity of L. Matthiessen. A contemporary physician-physicist-chemist of some renown, Augustus Matthiessen (1831-1870), is listed in several directories, and a detailed account of the circumstances of his suicide appeared in October 8, 1870, issue of The Times (London), but without a hint that he may have been a brother of L. Matthiessen. Augustus also is identified with a Matthiessen Rule, but for electrical resistance.

Invention of the spectacle temple:

Approximately half a millennium transpired between the first placement of corrective lenses immediately in front of the eyes and their support by shafts extending back to and contoured to fit snugly into the auricular sulci. This is the central theme of a well written but unfortunately unreferenced article, in German, by Erich Schütz, in Bild der Wissenschaft, No. 12, 1966, entitled "Die Geschichte der Brille" (History of Spectacles). The publication is a West German journal of natural science and technology.

The author traces the development of spectacles from the presence of the material components evident before the ice age through the fabrication and use of hand-held magnifiers, the religious controversies surrounding the invention of spectacles, and the subsequent variety of devices to hold them in place until temples as we know them now were invented in the 18th century. Schütz dates the temple invention in the second half of the 18th century, a bit later than the date of 1725 credited by Dr. Levene

to a Mr. Ayscough in the January 1972 issue of N.O.H.S., Vol. 3, No. 1, p. 9.

The article includes 30 illustrations.

Theunissen writes:

Following the mention of the Theunissen museum in our last issue (page 73) Mr. J.C. Theunissen, Rechtestraat 61, 5611 GN Eindhoven, The Netherlands, wrote me as follows:

"As an optician-optometrist I am very interested in historical optics. I have a private museum in my shop. Everything with lenses and optics is exhibited in vitrines (microscopes, nautica, cameras, scientific instruments, and of course spectacles, etc.). But we are now specializing only in early and unusual spectacles and cases, and books and prints about history of specs, and looking for them everywhere.

"Our museum is rather unique. We have such a big collection that visitors can buy almost any item that we have.

"Perhaps you can bring me in contact with other collectors, dealers, importers, or factories in your country. Perhaps you have books on history, or catalogues, or addresses of interested people.

"You may correspond in English, French or German."

He added the postscript, "Eindhoven is about one hour by train from Amsterdam or Bruxelles or Düsseldorf. Or one hour flying from London."

The Committee on Vision:

Quite serendipitously I came across a reprint of an article in the March 1963 issue of the Eye, Ear, Nose and Throat Monthly, Vol. 42, pp. 39-42, by Stanley S. Ballard and Milton A. Whitcomb entitled, "The Armed Forces--National Research Council Committee on Vision," which describes in personalized detail the first 18 years of the agency's history. It is much more knowledgeably done than my attempt in the July 1979 issue of NOHS, Vol. 10, No. 3, p. 49. The authors describe not only the committee's various title changes and sponsoring agencies but also its interdisciplinary membership composition, the varied pattern of its meetings and symposia, reports, and publications, and its administration.