The Museum of Visual Science and Optometry

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The Museum of Visual Science and Optometry is located in the Optometry building on the campus of the University of Waterloo. It forms part of the Waterloo Heritage Collections Association which also includes the Biology and Earth Sciences Museum and the Museum and Archive of Games. Administratively, this organization is separate from the University, but is closely related to it. The Museum of Visual Science and Optometry has its own board of consultants, consisting of several optometrists representing a cross section of the profession and its organizations.

The display area occupies approximately 100 square meters of space adjacent to the Visual Science Demonstration Theatre on the third floor of the Optometry building. Here, artifacts are displayed in six wall cases, two of which were donated by the Auxiliary to the Ontario Association of Optometrists and seven floor cases. As facilities are limited, the exhibits are changed frequently in order to utilize the entire collection. This problem will be alleviated in the near future when funding becomes available for six additional cases.

The collection includes early instruments and equipment, antique spectacles and cases, early diplomas, certificates and pictures, some rare books on Optometry and other materials of historical significance in the development of the profession and visual science in general.

The current exhibit includes a display tracing the development of the ophthalmoscope. Many of these early instruments were used primarily for indirect ophthalmoscopy. They were dependent on external sources of illumination, required a

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condensing lens, and were difficult to use by any direct method. Some were produced in 1865, an early date considering that Helmholtz first described his invention in 1850. Other instruments in the display include early battery type models by DeZeng, Keeler, National Optical and General Optical Companies. Cameron Surgical Company and E.B. Meyrowitz furnish examples of instruments for use with transformers. The various styles illustrate different types of gear systems for manipulating the focussing lenses, and utilize both May prisms and plane mirrors. One interesting model consists, unfortunately, of the head only, of a Decagon Ophthalmoscope made by Keeler of London, England. It was designed in 1930 as a measuring instrument to determine refractive errors and the extent and depth of retinal lesions, by utilizing different types of monochromatic light. Also shown, are two indirect instruments developed about 1910. One is a Laurence-Wood Orthops Ophthalmoscope designed by the noted Lionel Laurence who resided briefly in Canada about 1895. The

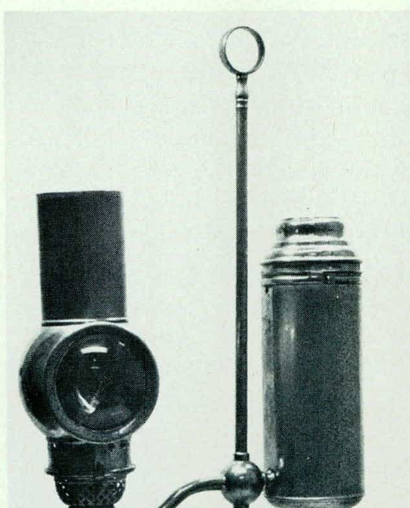

FIG. 1 Kerosene lamp used as light source for ophthalmometry and skiascopy, made by Manhattan Brass Co., New York & patented May 23, 1886 & June 15, 1886.

other is an instrument by Busch that uses the principles of Dr. Thorner who produced his first ophthalmoscope in 1899. Both are in the shape of small boxes measuring 25 × 8 × 5 cm. with an opening in each end. The objective condensing lens is replaced by a concave mirror and the eyepiece can be focussed. The instrument is placed close to the patient's eye which is shielded from external light by a rubber cup. The examiner then views the fundus which appears to be projected inside the box.

Another display presently on exhibit traces the development of the retinoscope and includes several non-illuminated mirrors from as early as the 19th century. There are plano and concave mirrors in several different diameters, some including axis-locating devices. All required an external source of illumination. One such source is exhibited and consists of two nickel plated cylinders; one contained kerosene and the other a lamp with a strong condensing lens. The light was adjustable so that it could be directed onto the retinoscope mirror. (Fig. 1) A considerable amount of skill was needed to catch the beam of light, direct it into the patient's eye and still observe the resultant shadow movement. It is no wonder that the development of an accurate subjective technique was essential.

Early keratometers comprise another area of the exhibit and a total of five distinctly different types are available for display. The earliest is a model produced by F.A. Hardy of Chicago, utilizing a metal and cardboard type of mire with light sources, consisting of four shielded lamps placed around the patient's head-rest (Patented May 9, 1849). Light from these lamps was reflected by the targets into the patient's eye. Each target was moved independently and the separation could be read from a scale that was then translated into the curvature measurement of the cornea. A later ophthalmometer, the Javal-Schiotz model was made by E.B. Meyrowitz about 1907 (Fig. 2). This was a forerunner of a third type shown, the Universal Ophthalmometer made by General Optical Company and used from 1910 to 1940 by many Canadian optometrists. There is also a

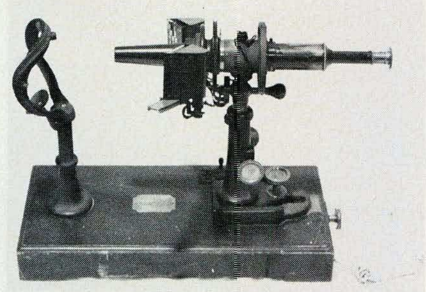

Fig. 2 Javal Schiotz Opthalmometer made by E.B. Meyrowitz and patented Dec. 31, 1907.

Chambers-Inskeep (C-I) instrument made by F.A. Hardy and Company about 1900. (Fig. 3) This type was later made by American Optical Company. While these may not be regarded as antiques in ordinary

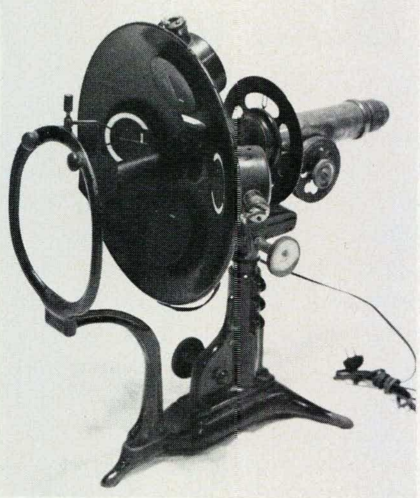

Fig. 3 Chambers - Inskeep Ophthalmometer manufactured by F.A. Hardy and Co., Chicago and patented July 16, 1901.

museum terms, it should be noted that the first development of such instruments by Jesse Ramsden took place in 1796, but they were not made at all practical until after the time of Helmholtz in 1856.

Other items shown include the Ives Acuity Apparatus described in the first volume of the Journal of the Optical Society of America in 1917. This device used a rotatable grating and created a form of Moire pattern to measure acuity. There is also a 1910 cabinet device for presenting single rows of Snellen letters to the patient through a mirror arrangement. The letters are on a scroll wound on rollers and the lines are changed by cords attached to a pulley.

A very unusual device for assisting in the selection of spectacles is also exhibited. To date no similar instrument has been located and the maker's name or date of manufacture are unknown. It is presumed that it dates from the latter part of the 19th century. The apparatus consists of a series of spectacle fronts with 34 different powered pairs of lenses which can be rotated in sequence before two eyehole openings. The patient viewed test letters through lenses ranging in power from +9.00 to −6.00 spheres. Perhaps this unusual device was a forerunner of the modern phoropter. (Fig. 4)

A display of early phoropters shows the development of the instrument from simple batteries of large open spherical lenses in front of each eye, through the reduction of lens diameters, the enclosing of the lens systems, the addition of cylindrical lens batteries, rotary prisms, Steven's phorometers and Maddox rods, up to the present time. There are a number of DeZeng instruments of succeeding issues, one Wolff Ski-optometer, and a Genothalmic Refractor, as well as more modern instruments.

Another component of this display, the Andrew J. Cross skiameter, was created by an ingenious arrangement of lens combinations. It

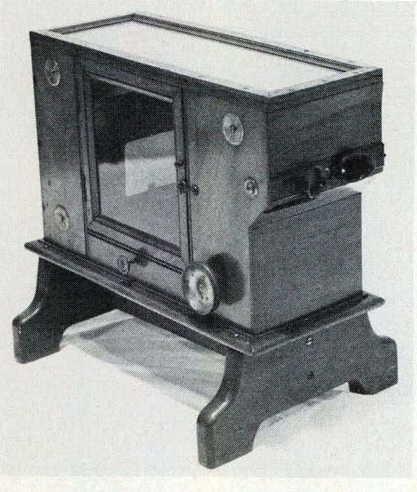

Fig. 4 Device for selection of spectacles, late 19th century.

was a device for measuring refractive errors. Various vertex powers were obtained in front of each eye by altering the separation of the lenses in the system, rather than changing the lenses themselves. This adjustment of the separations was controlled by looped cords fitted to pulleys. The length of the cords was such that the examiner could manipulate them at the correct distance for retinoscopy. The patient held the instrument and looked through the lens system, while the examiner used his retinoscope to neutralize the refractive error. As with most inventors, Cross was very proud of his instrument and described it in his book "Dynamic Skiametry" published in 1911.

Office furniture plays an equally important role and a fine example may be found in the 1860 examining chair presently on exhibit. Due to damage sustained in a fire in the Optometry clinic in 1969, this chair has been completely restored. It has stuffed mohair upholstery, mahogany arms, and adjustable head rest and can be tilted backwards. A bracket on the arm supports a holder designed to hold an oil lamp for retinoscopy. (Fig. 5) Dr. M. Stark of Toronto located this chair and also the light source mentioned above in an antique shop.

A 75 year old fitting table owned by the late Dr. N. Penwarden who practiced in Welland from 1915 to 1972 is another interesting addition to the collection. This double pedestal piece comes equipped with six drawers, the upper two lined with felt formed the display trays, while the lower four were used to store tools. Heavy plate glass covers the extreme right and left of the desk top affording the patient a full view of the "latest in spectacles."

The museum has a number of early spectacles dating from 1650. A valuable pair of Chinese tortoise shell were the proud possession of an English family for over 150 years. At some point, the elaborately carved bridge was broken but was skillfully repaired with a sterling silver plate on the back. A large number of 17th, 18th and 19th century spectacles are also in the collection. Some are made from sterling silver and are hallmarked, others are made from brass, blued steel, white metal, or horn. Dr. C. Tait of Toronto donated an extensive collection that enables us to display good examples. Many others have donated to swell the total to over 350 different types.

FIG. 5 Examining chair; cast into the iron base is the patent date, Sept. 4, 1860.

More recent models of celluloid and plastic are also featured. They illustrate all changes in spectacle construction from small oval and square shaped lenses to the larger round lenses of the 1920's. Temples show interesting changes including the hinged swivel design of early library straightback temple and the early sliding side types. Several are equipped with loop ends which were used to attach "ribbands" for security. About the turn of the century temple styles became curved to wrap around the ear. There were simple riding bow types of extremely fine wire as well as the more comfortable cable style.

A number of early spectacle lenses are found in the collection. There are a few quartz lenses, originally called pebble lenses and thought to have had very beneficial effects on the eyes, flat glass lenses principally with spherical corrections and others that are variously coloured. There is also a stock set of Perfection bifocals containing a number of oval shaped distance lenses of varying powers with a small semi-circle removed from the bottom of the lens. Semi-circles of additional powers were neatly fitted into these spaces and held in place by the metal eyewire of the spectacle frame. It would have been possible with this set to fit a patient while he or she waited. Several cement bifocals have been located and a very unusual cemented trifocal. The latter was made about 1930 by a St. Thomas optometrist, who mounted them in the fashionable rimless mounting of the day. The lens library is being developed to include examples of different lenses which have been available in the past, as well as a complete collection of lenses available at the present time.

A number of early spectacle cases form yet another interesting display. Some of these are made from wood and date from 1850. Some are plain and some are elaborately carved; some are open ended and some are equipped with either a hinged cover or a slide on cap. One is carved in the form of a small book. Others are made from black-japanned metal, papier mache, cardboard or leather. Several dated about 1890 have inlaid designs of mother-of-pearl.

Much of the historical data regarding the early days of optometry in Ontario has been donated to the Museum by the College of Optometrists and the Ontario Association of Optometrists. This material includes a framed copy of the first Ontario Optometry Act passed in 1919, the original charter of the Ontario Association of Optometrists issued in 1907, and the first minute books of both the Board of Examiners in Optometry and the Ontario Association. There is also a picture of the first Board of Examiners, and copies of the first qualifying examinations.

One of the more colorful displays is a collection of postage stamps from around the world depicting items of visual or optical significance. A number of countries have issued stamps on blindness prevention, stamps commemorating Ophthalmological Congresses and still others depicting famous scientists such as Pavlov, Von Graefe, Helmholtz and Galileo. Recently West Germany has issued several stamps with illustrations of instruments found in the Zeiss museum in Jena. While some stamps include illustrations of people wearing various styles of spectacles, it is interesting to note that very few subjects wear glasses in portrait stamps. Perhaps it has been a traditional courtesy not to display any physical weakness of a prominent figure.

Though the museum of Visual Science and Optometry is still in its infancy, much progress has been made toward developing this as a public resource. The materials in the museum have been catalogued in accordance with standard museum practice. A card index has been completed to aid in locating any particular artifact. Co-ordination with other museums is being developed through the Ontario Museum Association. Efforts have been directed toward the creation of a system that will benefit all levels of interest: the professional optometrist, the researcher, the museum curator or the Sunday historian. Exhibits are geared not only toward fulfilling the needs of the academic community but also toward accommodating a growing public awareness of the necessity to preserve history. Indeed, it would appear that interest is spreading for the museum has received articles from people throughout Canada. All of these contributions are greatly appreciated and it is hoped that suggestions and inquiries will follow. It is the aim of the museum to benefit the public at large as well as those with a closer professional interest.

Any person who has historical material pertaining to Optometry or Visual Science is asked to contact the Museum. While any early materials are useful, there is a particular need for early optical instruments, telescopes, microscopes as well as archival material dealing with Optometry's early history. Contact:

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Opinion - Hypnosis *cont'd from pg. 122*

school children. Much more research needs to be done and it is hoped that this article has created enough interest so that you will want to learn more about the possible uses of hypnosis in optometry.

How to start? Some excellent literature is available. Local societies often conduct courses. Possibly a lay hypnotist can provide a basic knowledge. There are a variety of courses conducted in the United States. Unfortunately very little of what is available is optometrically oriented but any knowledge can be useful. As the basic principles of hypnosis are assimilated and better understood, these can more and more readily be adapted to optometric use. As more optometrists show an interest in this field, it is hoped a course in optometric hypnosis can be established.

In the meantime, at least, keep an open mind – for the benefit of yourself and your patient.