HINDSIGHT

Newsletter of the
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2002 OHS Board Members and Officers:

Listed below are the year 2002 OHS Executive Board members and officers, and the year of expiration of each member's term:

President.....	Doug Penisten (2003)
Vice President.....	Jay Enoch (2002)
Secretary-Treasurer..	Bridget Kowalczyk (2004)
Trustees.....	Jerry Abrams (2005)
	Walter Chase (2002)
	Chuck Haine (2004)
	Melvin Wolfberg (2005)

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Call for nominations:

The terms of Board members Walter Chase and Jay Enoch will expire at the end of this year. Please submit your nominations for those two Board positions by May 15, 2002 to: David A. Goss, Hindsight Editor, School of Optometry, Indiana University, Bloomington, IN 47405 USA. The OHS members who receive at least three nominations and agree to serve on the Board will have their names placed on an election ballot to be mailed later this year with a copy of Hindsight.

Jay Enoch's Column:

Hermon Waldo Farwell, A.B. (1902), A.M. (1906), Dartmouth College Department of Physics, Columbia University, 1906-1949 December 29,1879, Keene, NH - June 2, 1978, Stamford, CT

Farwell Was An Advisor to Pre-Optometry and Optometry Students, and A Highly Principled Teacher of Physics and Optics

Hermon Waldo Farwell was "of the old school". Optometry students were often intimidated by this stern man of high integrity. He was an extraordinary demonstrator of physics and optics. His reputation as a professor was somewhat like that of the late Prof. Frederick Mason at the University of California at Berkeley. This gentleman trained in Physics at Dartmouth College in his native New Hampshire. Farwell served as Instructor of Physics at Dartmouth from 1904 -1906. While he served in that role, he also acted as undergraduate advisor to the then young Charles Sheard, who later founded the School of Optometry at Ohio State University. Farwell accepted appointment at Columbia University in 1906 (rising to full professor in 1929), and served there until his retirement at the end of June, 1949.

When I was a pre-optometry student at Columbia College (1946-1948), then an optometry student (1948-1949), Prof. Farwell served as advisor to me (also as advisor to James Cogan, Robert Phillips and William Pittman). We graduated Optometry in 1950. Thus, Farwell advised Sheard at the opening of his career, and our steadfast group of four were tutored by him at the very end of his career. This man influenced us, he frightened us, he taught us - not only physics, but a great deal about personal ethics and morality, as well as common courtesy. Farwell was a righteous man.

In 1949, in the Columbia Optometry School there were ca. 136 of us in the first year class. On the first day of our course in physical optics, Farwell stood at the entrance of his lecture theater, immaculately dressed in suit, starched shirt and tie, and welcomed us one by one. He offered us his hand, introduced himself as Professor Hermon Waldo Farwell, and expected us to give him our name in return. We then entered the lecture hall and sat down with an empty seat between each of us. We were not placed in order alphabetically in assigned seats. After seating us in this manner, he went around the room and called each of us correctly by our full name, without error or recourse to notes. At subsequent class meetings, he knew us by name, wherever we sat. When the bell was rung at the beginning of the class hour, the door was locked, and none might enter. There was no latitude, nor excuse for lack of punctuality.

Farwell prided himself upon giving the same examinations in his course, year after year. All papers were handed in, and each class had its mean and standard deviation determined. I vividly remember when he gave us our mid-term examination in physical optics. We did better than previous classes on this test. He called me and one other individual into his office. "Mr. Enoch your class was 14.6% (I made up this number as an example) above the established class average. This cannot occur by chance. Who obtained the examination?" The truth is, someone did obtain a copy of the test, and most-all of us shared this document. I and the second individual had no choice but to admit that a copy of the examination had been obtained. We did not know the source. Farwell unleashed his full fury on us with instructions to share his opinions with the class - which we did.

This same gentleman could be most kind. One day, bruised by a frank anti-semitic incident which I had encountered, I came to him for advice. He was surprisingly gentle, but firm. He was a pragmatic man, stating clearly that such action was wrong, in fact, grossly unfair, but

that in a real world one had to toughen up and roll with the punches. He advised standing one's ground, but that I should not let such unfortunate incidents deter me from acting properly and meeting my own career requirements.

He was an extraordinary demonstrator. Virtually every optical and physical experiment in the textbook was performed by him, and they all worked (!). How many hours of preparation did this take? Each form of optical interference was demonstrated, better than in the book, etc. I vividly remember his demonstration of an atomic chain reaction. He had (for 1948/9) the largest cathode ray tube I had ever seen up to that time, perhaps a 30 inch tube. He brought to the class uranium samples from the famous Columbia cyclotron lab located just below us in Pupin Hall. Each single splitting of an atom caused a brief baseline shift of the CRT beam of ca. +/- 6 or 8 inches from a baseline. He brought the uranium samples closer together. The once random firings started to increase; two, then four, then eight, then a literal cascade. We sat their grasping the arms of our desks (remember the atomic bombs were first detonated in 1945!). Suddenly, four assistants ran into the room from all corners with big containers of water and the uranium materials were separated and the reaction brought under control. He made his point in a stunning manner!

When we four pre-optometry students studied physics with Professor Farwell, his laboratory assistant was the later Nobel Laureate Polycarp Kusch who tried manfully to teach us the elements of pulleys and all variety of other devices and principles.

Towards the end of his physical optics course to optometry students in 1949, Farwell invited Charles Sheard (then an elderly man) to address our class. After leaving Ohio State University, Sheard had served for many years as Professor of Biophysics at Mayo Clinic. Sheard appeared with long flowing white-grey hair. He was a rather thin man with a rather pointed nose and chin, and prominent cheekbones. He spoke of the early days of optometry, and of Ohio State's optometry program. He also discussed the Sheard criterion, and more. We were deeply impressed! In later years, while I served as dean at Berkeley, I had opportunities to discuss Charles Sheard with his daughter, then the wife of long-time UCLA Chancellor Charles Young.

Hermon Waldo Farwell left an indelible mark upon all of us. This very special man instilled rigor and integrity, and a sense of self worth, while demanding our very best. Optometry should remember this man who served us so well!

J.M.E.

Optics and the Old Masters by OHS member Robert A. Koetting:

Optics and the Old Masters

Robert A. Koetting, O.D.

Norman Rockwell used photographs to plan his famous magazine covers, but did the great masters also cheat a little? You bet! And, optics have probably been part of the art scene for much longer than we've thought.

In New York, last December, a two-day conference included a startling presentation by world-renowned artist David Hockney, working in collaboration with University of Arizona physicist Charles Falco. They claim that, as far back as the 1420s, master painters were deploying optical devices to render lifelike images of people and their surroundings. The conference, which opened with the American premiere screening of Hockney's recent BBC documentary, brought together their principal supporters for the first airing of views before art historians, critics, scientists, and painters.

Most art historians believe that the majority of European painters since the Renaissance deployed elaborate systems of mathematical perspective to achieve their effects. Hockney and Falco have been arguing, on the contrary, that many artists, going all the way back to Bruges in the 1420s, were deploying a variety of optical devices, including concave mirrors, lenses, and cameras obscura. In effect they suggest that painters (Van Eyck through Caravaggio, Lotto, Velazquez, Vermeer, Chardin, Ingres, etc.) were using precursors of photographic cameras for centuries before the invention of chemical fixatives in 1839. Furthermore, it was only with the introduction of practical photography that European painters became disenchanted with the "optical look," and embraced impressionism, expressionism, cubism, and the rest of the modernist tradition.

The suspicion probably first arose when Hockney noted that sketches done by Auguste-Dominique Ingres about 1800, showed no signs of "groping." They were clear and precise from the very first strokes. Like those of Andy Warhol, nearly two centuries later, they likely traced over a projection of some sort.

In 1543, Lorenzo Lotto included blurred parts of a table cloth indicating that some sort of lens with a limited depth of field had been employed while painting the props used in a portrait. As early as 1430 artists had suddenly begun to record much more realistic detail, but why? Lenses or pinhole devices, projecting a traceable image on an inverted canvas, could have been responsible. Distortion from a camera obscura might have been corrected by the reflection from a decorative convex mirror commonly in use (and even depicted in some paintings) at the time.

Further evidence of multiple projections can be found in a variety of 17th century pieces where different perspective "vanishing points" and relative size differences are common. A bizarre distortion in a Van Dyck of 1636 would have the seated subject about twelve feet tall if she had been standing.

A 1431 sketch of a Cardinal by Van Eyck shows many small features identical to a painting made years later when the subject was not available. The later painting is 40% larger, proving that some sort of projection was undoubtedly involved.

For the most part, art historians have long assumed that most of the Old Masters achieved their astonishing effects through preternaturally gifted "eyeballing," or following the Italian Renaissance, through elaborate mathematical perspectives. Now an alternative seems a strong possibility.

On Charles Sheard and Carel Koch:

OHS member John N. Schoen of Owatonna, Minnesota, wrote the following note concerning Charles Sheard and Carel Koch:

Thank you for the HINDSIGHT - it is a fine publication, usually with fascinating articles.

One recently was the remembrances of Charles Sheard by his daughter.

You may know that Dr. Sheard taught in the medical school of the University of Minnesota under Dean (Dr.) Harold Diehl. Conforming to pressures within the AMA at the time, Diehl mandated that anyone teaching in the medical school have a M.D. degree.

That degree was offered with the stipulation that each spend a year as medical students to both Dr. Sheard and his chosen assistant, Carel C. Koch, O.D. Koch thought little of such an arrangement and spelled out the entire picture in a letter. This letter was in my possession, having succeeded Carel as Academy Secretary - I found it in his papers.

When Dr. Koch died, the Minnesota Optometric Association devoted most of its monthly publication to the man. I was asked to lend them the letter and did so with the firm stipulation that it be returned to me.

It never was. Efforts by Association officers and the paid Association secretary failed to locate it. I can only assume that the journalist who wrote the MOA Journal destroyed the letter. I regret being unable to back these assertions with the printed Koch letter, but thought knowing this might be of some interest to you. It is evidence of the caliber of man that both Sheard and Koch were.

A review of a book on the history of the mirror:

The Mirror - A History, by Sabine Melchior-Bonnet, translated from the French by Katherine H. Jewett, New York: Routledge, 2001, 273 pages plus bibliographical notes and an index, ISBN 0-415-92447-2 (originally published in French in 1994 under the title *Histoire du Miroir*)

This book presents a cultural history of the mirror from its antecedents in ancient civilizations up to the 20th century. The book consists of three parts of almost equal lengths. The first part deals with the development of the manufacture of glass mirrors and the competition for preeminence in the industry. The second part considers a social history of the mirror and how the mirror has altered the perceptions of humans about themselves. The third part is mostly a contemplation of the representation and uses of the mirror in literature, art, and philosophy. I found the first part of the book to be the most interesting, and this review will concern itself primarily with that part. The book concerned itself primarily with Europe, and with France in particular.

Melchior-Bonnet suggests that humans have always had a fascination for viewing their own reflections: "Man has been interested in his own image since prehistoric times, using all sorts of expedients - from dark and shiny stones to pools of water - in order to catch his reflection. The myths of Narcissus, who is enchanted by his own image, and Perseus, who makes Medusa see herself in his shield, bear witness to this early curiosity toward reflecting surfaces.... He had to wait centuries, however, before he could obtain a bright, clear, and true image of himself."

Some ancient Mediterranean civilizations, including Mycenea, Greece, Etruria, Rome, and Egypt, made metal mirrors, using variously a copper and tin alloy, bronze, silver, and rarely, gold. Greek mythology attributed the invention of the mirror to Hephaistos, the Greek god of fire and metal. Some Corinthian pottery from the 5th century B.C. include scenes of people gazing at themselves in metal mirrors attached to handles or footstands. These mirrors were convex or concave and were generally small - five to eight inches in diameter.

Primitive glass mirrors have been uncovered from archeological digs of third century A.D. Egypt, Gaul, Asia Minor, and Germany. They were only one to three inches in diameter. The first written reference to glass mirrors appears to have been by Pliny the Elder in first century A.D. Rome. He credited their invention to the people of Sidon (in present-day Lebanon), "makers of glass."

Because of the difficulty in making early glass mirrors and their poor quality, metallic mirrors were preferred for many years. Obstacles to producing good quality glass mirrors were the inability to produce flat, thin, and transparent clear glass, and the inability to apply a layer of metal to the glass without the heat of the metal breaking the glass. Difficulty in producing clear uncolored glass continued into the Middle Ages.

A 12th century monk named Theophile described contemporary glassmaking in France. To make window panes, the molten glass was blown into a tray. Small pieces were then cut out. However, glass windows remained small and rare into the 18th century. Another early technique for sheets of glass was to blow a cylinder through a straw, then splice the cylinder and spread it over a flat area.

An early technique for reflective silvering of mirrors involved the application of hot lead to a sheet of glass. The resulting mirrors were small and had a bulging shape. In the 14th century, a technique was developed for applying lead without heat and then soon thereafter metals other than lead were being used. The mirrors of that time still often produced distorted images.

In the early 16th century, the leaders in glass mirror making may have been in Lorraine and Venice, with the Venetians establishing almost a monopoly as that century progressed. The Venetians did well because they found the formula for silicate of potash and lime to mix with sand to make clear glass.

The author relates tales of industrial espionage in the 17th century. In the mid 17th century, the elite of France were importing hundreds of cases of expensive Venetian mirrors. King Louis XIV "bought thousands of pounds worth of mirrors from the Venetians in 1665." France covertly tried to entice Venetian mirror makers to its factories to learn the Venetian manufacturing secrets. Venice, however, protected its superiority by giving significant benefits to its workers, as well as significant threats, such as prison for family members left behind if a worker did desert. Eventually France did develop a strong mirror industry and by the late 17th century they were able to overcome the Venetians because they developed the capability of producing larger mirrors than the Venetians.

Mirrors were mainly purchased by the elite in the 17th century, but they became more commonplace in the 18th century. In about 1750, about two-thirds of the people living in Paris had a mirror. Most of these mirrors were still small in size - only about a fourth of these mirrors were more than 20 inches in height. However, mirrors were less common outside of the cities of France. In one area of the Loire Valley, there were only seven or eight mirrors in the inventories of 100 modest households conducted between 1735 and 1755. Mirrors did not become common in rural homes in France until the early 20th century.

Much of the book deals with the cultural, psychological, literary, magical, philosophical, theological, and artistic symbolism of mirrors. The mirror could be viewed as fostering social bonds, but also as promoting vanity. It could aid introspection, but could also lead to prizing image over substance. The author gives many examples of the use of the mirror as a metaphor in literature, philosophy, and art.

D.A.G.

<u>The importance of George Washington's presbyopia in American history</u>:

OHS member Jerry Abrams sent me an interesting article published in the January, 2002 issue of Archives of Ophthalmology (volume 120, pages 65-66). It was authored by Ronald S. Fishman of the Institute of the History of Medicine at Johns Hopkins University.

The article recounts a confrontation of George Washington with his Revolutionary War officers who hadn't been paid for almost five years. This occurred in March of 1783 when the peace negotiations were almost completed. The officers were conspiring to force the Continental Congress to give them what had been promised to them. Washington saw the crucial importance to the new republic of avoiding having the military intimidate the Congress.

Before meeting with the officers, Washington prepared a speech. Washington was 51 years old at the time and had just received his first pair of his own spectacles for presbyopia. But Washington wrote out his speech in large script so that he could read it without his spectacles.

When his "calm and reasonable" speech failed to sway the minds of the officers, Washington decided to read a letter he had received from a member of Congress. He was unable to read the smaller print, so he reached into his pocket for his spectacles. As he adjusted them, he said, "Gentlemen, you must pardon me. I have grown gray in your service and now find myself growing blind."

Washington's admission of a physical weakness appealed immediately to the men's affection for him. This was a turning point, and the officers reassured Washington that they would trust in the Congress to provide them with their benefits, which were eventually forthcoming. The article's title, "Presbyopia's Finest Hour," seems quite fitting.

D.A.G.

Borish on the heritage and future of optometry:

In the Fall, 2001 issue of the Indiana Journal of Optometry (volume 4, number 2, pages 23-31), Irvin M. Borish writes on the importance of an appreciation of the heritage of optometry for an informed consideration of its future. He discusses how optometry flourished in the area of refraction because medicine did not initially embrace the use of spectacles. He relates many of his experiences of 20th century developments in the optometric profession and optometric education. He cautions that optometry's present-day enthusiasm and emphasis on the use of pharmaceutical agents could leave a vacuum in the area of optometry's traditional strengths. It makes for some interesting reading and reminds us that we can learn important lessons from history.

D.A.G.

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