

OPT

Indiana University

DEC 16 1986

Library

NEWSLETTER
OF THE

OPTOMETRIC HISTORICAL SOCIETY
(243 North Lindbergh Boulevard
St Louis, Missouri 63141, USA)

Vol.17

October 1986

Number 4

OPTOMETRY LIBRARY

DEC 18 1986

December annual meeting:

INDIANA UNIVERSITY

The Optometric Historical Society regularly holds its annual meeting in conjunction with the annual meeting of the American Academy of Optometry which this year is to be in Toronto, Canada. The 1986 OHS annual meeting will begin at 6:15 p.m. on Saturday December 13 in the Yonge Room of the Toronto Hilton Harbour Castle Hotel. OHS President Jerry Abrams will preside and guest speaker Dr. E.J. Fisher, Curator of the Museum of Visual Science and Optometry, School of Optometry, Univeristy of Waterloo, will present, "Canada is Optometrical History."

History has value:

Even without making a statistical study of the optometric serial publications of various countries one need only scan the literature briefly to become firmly aware of the much greater interest in ophthalmic history in certain countries. A single just received magazine from East Germany prompted this reminder. The May/June 1986 issue of Augenoptik, Vol. 103, no. 3, received by surface mail in August, has an attractive front cover showing most of a page of an incunabulum with part of it magnified by an early "Lesestein" (literally: reading rock). In the text of the same journal itself are three articles of historical interest.

The first is "Die Entwicklung der Nahsehhilfe" (the development of specatcles for near) by G. Ueberschaar, pages 66-71. With technological sophistication Dr. Ueberschaar traces the near vision aids from adaptations of burning lenses and Ptolemy's water-filled glass spheres through the evidences in fourteenth century portraits, the inventions of multifocals, flexifocal designs, Fresnel zone plates, Alvarez principle, and the varifocals. Documentation includes 17 illustrations, mostly diagrammatic and numerous mathematical analyses.

The second article is a historical column by C. Kuhn, pages 81-83, with commentary on the categorical distinctions to be made in the use of the overlapping terms "spectacles" and "visual aids". Also included are

several photographic illustrations from the author's own collection of antiques. Further, he comments on the contributions of Christian Scheiner, Daza de Valdes, Pistor, von Rohr, Johann Duncker, King Friedrich Wilhelm III, Gullstrand, Benjamin Franklin, George Adams, and numerous others.

The third article, on page 83, is a reprint of an article by H. Ketteniss in Neues Optikerjournal (Pforzheim, West Germany) 3/1986, p. 14, entitled "Alteste Nietbrille in Freiburg gefunden" (The oldest riveted spectacles discovered in Freiburg). It reports the finding of spectacle fragments during excavation for an underground garage in 1982 in Freiburg in West Germany.

For a long time the riveted spectacles were known only from artists' illustrations of the early 14th century. From the other objects in the immediate surround it appears that the Freiburg spectacles may date back to almost 1278. The fragments are on display in the Freiburg Museum of Prehistoric and Ancient History.

One may well ask whether the awareness of such historical details has a value to the profession and the individual optometrist. The cultural value can hardly be denied even by the least sophisticated among us, but is there a tangible, practical, merit as well?

Surely in a profession that leans so heavily on the efficacy of a wide variety of visual aids and an understanding of their functional limitations and clinical effects there must be an advantage to the individual optometrist who appreciates the related efforts, theories, experiments, discoveries, and inventions of some of the most brilliant minds in the history of civilization. The ordinary half diopter lens of today is no lucky accident. The history of its development could fill a book with fascinating chapters. It is not irrelevant to this point that the most prestigious ophthalmic periodical on the European continent in its monthly issues of the past couple years published all of the chapters of a new geometric optics textbook in serial form. This was surely not merely for cultural edification.

Indeed it would be hard to identify another single branch of knowledge that might have greater practical value than intelligent history. Besides, it is so interesting.

Making history now:

Owr OHS president Jerome J. Abrams, O.D., and our OHS immediate past president James P. Leeds, O.D. are both in leadership roles in the current drive to raise two million dollars to support the establishment of a School of Optometry at Tel Aviv University in Israel. According to a news release received in August from the American Friends of Tel Aviv University, Inc., the school, scheduled to be opened in 1987, will be the first of its kind in Israel and in the Middle East.

Archives "down under":

A half page of the Forty-fifth Annual Report of the Victorian College of Optometry, Australia, is devoted to "The Archives" and the fact that two "honorary archivists", Michael Aitken and Brian Flynn, have for many years collected, catalogued, and preserved documents, books, spectacle frames, and ophthalmic equipment. Each year they put part of the collection on display in the conference room of the college. For the 50th anniversary of registration of optometrists in Victoria they displayed letters, documents, photographs, and records of examination results relating to the original registration in 1935.

A quack gets flogged:

In the June-August 1986 issue of The South African Optometrist, Vol. 45, No. 2, pp. 69-71, editor David Reynolds reprinted the following two-page article for a 1929 Johannesburg weekly paper called The Sjambok. A sjambok, incidentally, is a whip of dried hide for flogging. The significance of the article is considerably enhanced by the realization that in 1929 optometrists were not registered in South Africa and were then known as opticians or ophthalmic opticians.

Dr. Reynolds explained merely that the "fascinating publication turned up on my desk the other day."



THE SJAMBOK

Editorial and Business Offices: Phone Central 2507.
23, Sanderson's Bldgs., President Street, Johannesburg.

Subscription Rates, 15s. Post Free. Overseas, 17s. 6d.
All Subscriptions should be sent to C.N.A. direct.

For Advertisement Rates, address Business Manager.

A Weekly Critical Paper for the Spreading of the Truth.



Vol. 1. No. 15.

JULY 26th, 1929

Price Threepence

The Great London Eye Specialist

AMUSING SCENE AT HATFIELD HOUSE

Eye-Wash for the Hawk-Eyed

Despite the fact that the reputable Press of this town has ceased to accept advertisements for the South African Eye and Ear Institute, the two "great London optometrists," Mr. Arthur Gainsborough and Mr. Arthur Lewis, continue to operate gaily in their shabby consulting rooms at Hatfield House, and we have no option but to revert to the subject of their self-lauded operations, in the hope of persuading them to abandon their attempts at Eye Washing Johannesburg. Their impudence truly is colossal.

Mr. Arthur Gainsborough, "the great London specialist," was working as an optician's (or oculists's) assistant in this very town under his rightful name of Abraham Ginsberg, barely two months before he flooded the Press with boastful publicity. He is said to have practised as a chemist for a while in Durban; but his contempt for the intelligence of a city that once claimed to possess "most brain to the square yard," can only be styled as amazing and insulting.

Mr. Arthur Lewis, on the other hand, was in hot water overseas only a little further back, for on January 5 "John Bull" devoted over half a page to him under these headings:—

SUNLIGHT CLINICS: GRAVE WARNING.

Quacks Under the Ray.

At the top left-hand corner of the exposé, was the accompanying pic-



Arthur Lewis, a notorious quack, who presided over a "Sun-ray" clinic in Glasgow.

ture, exactly as now reproduced by us, caption and all.

Some of the statements made by "John Bull" were withheld from last week's article pending further investigations.

But now we discover that a certain similarity exists between the methods of the "Sun-Ray" Clinic and the South African Eye and Ear Institute.

John Bull said:—

"The value of efficient sun-ray treatment is not to be disputed, but, as

we have had cause to remark on so many occasions, it is essential that it be carried out under the most dependable medical supervision.

"In spite of the New Era Sun-Ray Clinic's contention that it employs a 'perfected treatment,' we feel that there are grave grounds for doubt in the matter.

"One gentleman, who called for a consultation, was received not by a medical man, as might be expected, but by a Mr. Goldman.

"When he expressed surprise and a reluctance to proceed without a qualified doctor, Mr. Goldman explained that while he himself examined patients and prescribed the course of treatment, everything was subsequently carried out under a medical man's supervision!

Ambitious Object.

"As the enquirer was not enamoured of this topsy-turvy arrangement of the unqualified man taking precedence over the qualified practitioner he did not proceed with the treatment.

"We think he was wise, for enquiries that we have made regarding the New Era Sun-Ray Clinic do not inspire confidence.

"In the first place it was established only as recently as November

1929 Witwatersrand Show: Gold Medal CASINO Brandy, Gin and Liqueurs.

15 last, and, in spite of its claim that its premises at Leicester have been equipped without regard to cost, we find that only £2 of its authorised £600 capital has been paid up!

"Even with the full £600 behind it, it could not hope to get very far, for its objects are 'to carry on the business of sun-ray and ultra-violet ray clinics, or institutions, and to buy, sell, hire or manufacture apparatus and instruments used in connection with such business.'"

But that is not all. In February of this year an advertisement appeared in a Glasgow paper calling attention to "marvellous cures" effected by the "Glasgow Sun-Ray Centre."

[And then followed the statements published by us last week.]

Now to get at the truth we asked a lady to accompany our artist last Friday to the South African Eye and Ear Institute, for the purpose of finding out if Mr. Abraham Ginsberg and Mr. Arthur Lewis did themselves examine the patients and otherwise operate. Before going there, the "patients," who have perfect sight, were shown the "John Bull" portrait of Mr.

Arthur Lewis. Our artist, after leaving, sketched one of the "optometrists" who ran the business and who declared they were "the bosses." Here is the drawing.

No doubt whatever, is there? The Mr. Arthur Lewis exposed as a quack in "John Bull" is the Mr. Arthur Lewis whose name had not transpired in connection with the South African Eye and Ear Institute . . . until The Sjambock published it last week.

Now to the "optometrics" that go on at Hatfield House.

Let the lady herself describe what took place.

A Nice Little Comedy-Farce.

"We decided *pro tem* to be husband and wife, and had a preliminary rehearsal . . . The worst of rehearsals is that the absent people of the play don't say the things they should say . . . ! However, we reached the Eye and Ear Institute. There was a girl seated at the desk.

I want to see the boss," my newly-acquired husband asked her, in his newly-acquired Boer accent.

A man appeared from the inner room. "I am the boss, Mr. Gainsborough."

"Because I want my wife to see the best man."

"Yes, yes, don't worry."

He took us into a darkened room. I was seated at a table and looked into the honest horn-rimmed spectacles of Mr. Gainsborough.

Together we told him a sad tale of connubial bliss marred by my headaches. The last three months I had been troubled with shooting pains and flashes of light in my eyes, things blurred before me . . . Then we had seen an advertisement in the Sunday Times. Something must be wrong with my eyes! I sewed a great deal . . . The glare on the diamond diggings . . . our words trailed away.



Mr. Arthur Lewis, as sketched by our artist.

"Yes, yes, I quite follow. I am Mr. Gainsborough." Now Mrs. Van der Merwe look at this pencil." Rapidly he dodged it between his nose and mine. "Ah . . . Yes . . . Now you see it double." I hadn't time to see anything. Within a minute he had diagnosed astigmatism of the left eye. "You will have to wear glasses!" he said decidedly.

"But I want my wife to be tested, like you write in the papers."

The "great optometrist" jumped.

He is really not a very good showman and had forgotten all about his impressive machine. However, he covered up his error. "Of course, I shall apply the test." He looked again into my eyes. And then horror! . . .

"YOU HAVE A SQUINT."

O, Mr. Gainsborough! You did for yourself with those few thoughtless words. In your next establishment don't tell women they squint. It's tactless. Especially when they don't. I don't. Not any more than I suffer from headaches or shooting pains or from making my own clothes. I never touch a needle except to take out a splinter, nor have been to the diamond diggings, nor am I married.

Bursting with inward laughter I sat at the Keratometer. When I had sat we discussed the glasses. A *very inferior* kind would cost £3 3s.; but it would be *much* better for me to have the real Crooke's variety! These consisted of a wonderful tinted glass to absorb the rays of the sun. They would cost but a paltry guinea more!

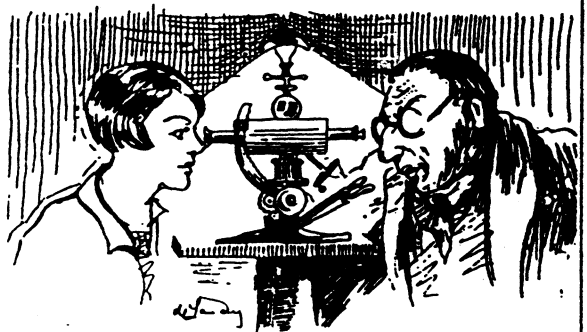
I demurred, but my husband, with true Boer generosity, insisted on nothing but the best. He was very anxious to get his two sketches! So when I was undergoing a final examination in another room where I read letters off a board, the great Mr. Arthur Lewis, whose classic features we had seen hitherto only in the columns of "John Bull," was produced in order to calm the good Dutchman's suspicions.

I don't quite know what the test was about, but I discovered that of the two eyes, my right was the weaker!

The truth is—may I whisper—there is nothing wrong with my eyes at all. I don't squint, and I haven't an astigmatism, yet I have something (it isn't green) that any eye doctor worth his salt could see, for it is Incurable Scepticism. . . .

But now the seance was over . . . at least *nearly*. I am forgetting the curtain. Mr. Arthur Gainsborough, né Abraham Ginsberg, came forward. "A deposit is the usual thing," he murmured . . . on the blind side of me. But "my husband" and I had the intelligent foresight to leave our money at home.

We fled.



Dr. Arthur Gainsborough, the great London Spectralist, gazes across the Keratometer . . .

A scientist's view of vision:

Our recent attention was called to the September/October 1964 issue of The Rockefeller Institute Review, vol. 2, no. 5, on pages 1-7 of which appeared an address entitled, "Physics, Biophysics, and the Study of Vision" by Professor Haldan Keffer Hartline. The address was delivered in response to Dr. Hartline's receiving the annual Albert A. Michelson Award at the Case Institute of Technology, now a part of Case Western Reserve University, Cleveland, Ohio. Michelson, incidentally, was America's first Nobel laureate in the sciences. The award was given to Hartline in recognition of his "noteworthy research on the sense organs and how they relate the behavior of animals to their physical environment and especially for classical discoveries in the physics and biology of visual perception."

To the 800 persons attending the Award dinner Dr. Hartline outlined his concept of the history of visual science, pointing out that, "Optics, as its very name implies, arose from a curiosity as to how we see." He added that this question was one of the first to be examined by the emergent science of the Renaissance. Further, "Kepler, taking time from his pioneering work in astronomy, applied his mathematical genius to the subject of vision. After him, optics as a branch of physical science flourished-----and flourishes today. With it, the lens-maker's art developed into a robust technology, yielding a wealth of optical instruments for the benefit of all branches of science. Physiological optics developed steadily after Kepler and reached its culmination in the work of Hermann von Helmholtz."

Hartline then reviewed visual science evolvments in biophysics, psychophysics, visual photochemistry, psychology, neurophysiology, and a long string of other disciplines as intimately related to vision.

Ongoing Optometric History:

That optometry continues to undergo changes in role as well as in technology seems obvious to many of us, especially to those of us curious about our historical developments. Rare, however, is the finding of reliable contemporary descriptions of such trends, for it is difficult for one to describe trends of which he or she is a part. An exception is an article entitled, "A Century in Eye Care", an interview of Dr. Adrian Hill, chief optometrist at the Oxford Eye Hospital, Oxford, England, by Janet Voke, herself an optometrist with a family

background rich in visual science. It appears in the July 5, 1986 issue of Optometry Today, Vol. 26, No. 14, pp. 477-482.

In this instance Dr. Hill has been on the staff of the hospital only eight years, having taken over the responsibility of his predecessor of 35 prior years. The hospital itself is celebrating its centenary. In response to Janet Voke's penetrating questions Dr. Hill describes the evolvement of the optometrist's role not merely in terms of the expanded areas of "optical correction of defective signs" but also in "the assessment of most aspects of visual dysfunctions."

The latter includes ophthalmic electro-diagnosis, ocular ultrasound scans or biometry, special psychometric investigations such as dark adaptometry and spatial contrast sensitivity, involvement with facial prosthesis, color vision evaluation, low vision reading aid assessment, domestic lighting aid, orthoptic counseling, and consultation in preschool, industrial, and occupational visual screening.

Optometric lineage:

Clearing out his accumulated files, a dutiful retirement pastime, OHS member, D.G. Hummel, O.D. reports finding a memo to himself stating that the late Arthur P. Wheelock, O.D. was the last male lineal descendant of Reverend Wheelock, founder of Dartmouth College, and that Dr. Wheelock's grandmother was a Prentice.

The fragility of historical records:

"Where Have All Our Records Gone?" is the title of an article by Emma Cobb in the Fall 1986 issue of American Heritage of Inventions and Technology, Vol. 2, No. 2, pp. 8-9. She reminds us that with our rapid technological developments much of the electronically recorded information of the world has already become inaccessible by reason of the dismantling, abandoning, or discarding of compatible retrieval systems. For example, a big batch of microfilm copies of every enemy document captured by U.S. forces during the Vietnam War cannot be read by any instrument known to exist still today. Similarly, the five thousand reels of magnetic tape records of the 1960 census became completely irretrievable by 1975 because the type of UNIVAC required no longer existed. Says the U.S. Committee on the Records of Government "the United States is in danger of losing its memory."

Can this happen in Optometry? Indeed, I can cite a personal experience. About 25 years ago I decided to study the relationship between driver's vision and highway accidents involving many thousand testing and interviews records from around the country. By the time I had gotten the variously supplied data transcribed into pencil dots on a special computer form the computer equipment at my university had been replaced by a different model which could not read my form. Locating a compatible model at an institution about 100 miles away, I had to ship my cartons of data there for transferring to a tape which could be read by our newer model. From this I prepared and published a report based on the single factor of visual acuity.

I then anticipated doing a whole series of analysis of other visual factors, but a couple of years ago I was informed that my university has again changed its computer model. The tape is now collecting dust on my office shelf.

The fragility of early records and archival evidence has long been heavily felt by historians. Nor is it seeming to change.

H.W H.

The oldest lens extant?

OHS member Jay M. Enoch is convinced that the cornea of the eye of a bull's head rhyton (drinking horn) dated 1550-1500 BC was designed to function optically. The steatite (soapstone) artifact is located in Case 51, No. 1368, at the Herakleion Museum on the Island of Crete. It was brought originally from the Little Palace in the ancient city of Knossos on the north coast of the island.

Dr. Enoch presented the arguments for his conclusion in a paper read at the International Symposium on Visual Optics, Tirrenia, Italy, May 2-4, 1986, the proceedings of which are being published by Springer Verlag, Heidelberg, West Germany. A copy of Dr. Enoch's manuscript is on file in the International Library, Archives, and Museum of Optometry (ILAMO) in St. Louis, Missouri.

Reviewing first the glass technology of the era, secondly the definitive attributes of a lens, thirdly the observable optical traits of the bull's head cornea in question, and fourthly the ancient literary references to pupillary functions and images and their cultural interpretations, he concludes that, though also decorative, "This is the first clear evidence of lens use."

Ophthalmological publications in America:

"A Brief History of Ophthalmic Publications in America" by Daniel M. Albert, M.D., in the May 1986 issue of Ophthalmology, Vol. 93, no. 5, pp. 699-708 is an excellent commentary on ophthalmology-related publications that have appeared, though not necessarily printed, in America. The author points out that, "If you go all the way back to colonial America, you will find that there were few American medical books and fewer formally trained physicians." He mentions as a prototype the manuscript by Cotton Mather (1663-1728) entitled "The Angel of Bethesda," reprinted in 1972 by the American Antiquarian Society, Barre, Massachusetts, "compiling all the medical knowledge available in the colonies." Chapter 32 is said to be devoted to the eye and includes comments on "the use of spectacles."

The first American textbook on ophthalmology was by Dr. George Frick in 1823. It included a section on refraction which "was merely a three page definition of myopia and presbyopia," though a portrait of Dr. Frick shows him wearing spectacles.

Dr. Albert's only other reference to ophthalmic optical aspects of ophthalmic history is in the citing of the long title of an 1836 book on the eye by a New York oculist named William Clay Wallace which includes, "...with Remarks on the Use of Medicines as Substitutes for Spectacles."

The 63 references are virtually all related to the medical and surgical aspects of ophthalmology, i.e., with almost nothing in visual science and ophthalmic optical science. Such a fine bibliography of ophthalmological history could well provide a convenient opportunity for someone to trace the chronology of ophthalmological involvement with the basic visual and optical functions of the eye, including the many centuries of use of spectacles.

Some double-aught thoughts:

Is there a hobbyist who collects optical company publications? I have in mind catalogs, instrument manuals, instructional brochures, and perhaps even promotional leaflets, the very items that are normally presumed to have only highly transient value and are typically disposed of immediately upon their recognition. To suggest that they should be preserved would make most of us groan. Storage space alone would be prohibitive.

Just dating each item would be a task, say nothing of setting up a workable system of filing and indexing for retrieval purposes, an archival nightmare. But fortunately many a hobbyist can enjoy the most time-consuming drudgery when it is in pursuit of his or her recreational objective.

Might there be merit in such a collection? Surely most of us would smile a bit amusedly at any expression of assurance of its great value. But is not the lack of apparent merit true of the major share of the activity we undertake? Indeed, think about that slowly. Just thinking about it may be the most meritorious activity you have undertaken in days. But now I return to my question.

Much, but not all, of the information in optical company publications occurs in the advertisement section of professional journals. Some, but not all, librarians remove and destroy the advertising pages of journals before permanently binding them, thus to save shelf space and literary bulkiness. A justification of such policy is the utter repetitiveness of the advertisement content.

Such practices and attitudes of course are what explain the rapid disappearance of company publications, whether in the form of journal advertising or commercial handouts. They are virtually never copyrighted, which would at least provide for their accumulation in a federal office. They are rarely dated, thus undermining their eventual documentary value. Nevertheless, their technical content and descriptions are characteristically precise in spite of being a bit flowery, for a company must stand behind its claims if it wants to survive. They often include excellent photographic and schematic illustrations unavailable elsewhere. Many a practitioner relies heavily, and perhaps sometimes solely, on the continuing education he derives from current optical company publications.

What prompted these thoughts? Some months ago I had come across the newsletter of a local medical historical society which bears the delightful title, Snakeroot Extract. Wondering if I could come up with an analogously clever title for the N.O.H.S. I momentarily came up with The Double Aught Lens and then wondered how that had come into my historical consciousness. It seemed to me that when I was a very young optometry student I had heard an "old timer" refer to "double aught lenses" as the prevailing choice of his era.

I hastily wrote David Cline of the Dictionary of Visual Science knowing that in his very early years he had been employed by a spectacle firm. He vaguely remembered the term and eventually referred me to a 1912 American Optical Company catalog on page 204 of which are the detailed sizes of uncut and edged spectacle lenses and segments. The "00" eye size was the median of seven sizes, namely, 2, 1, 0, 00, 000, 0000, and Jumbo, ranging in bevel edge lenses from 26 x 35 mm to 37.4 x 45.4 mm respectively. Numerous other size designations are also listed, but it appears that the "00" was the most common choice of the era.

Whether it was pronounced oh oh; double oh; double aught, double ought, double naught, double nought, or double zero, is not revealed, but perhaps a few of our older readers will try to recall and inform me.

But again I have digressed from the issue of optical company literature. The 1912 American Optical Company book is a magnificently bound hard-cover volume of 350 pages of heavy glossy paper with a well edited 1833-1912 historical chapter profuse with excellent photographs. Each category of ophthalmic optical products is introduced with sophisticated text material and technical explanation. Like the best of textbooks a table of contents is included and an index of more than 400 entries ranging from "Adjustable Guards" to "Zylonite Rims".

Browsing further in the optometry library at Indiana University I discovered another catalog entitled "Ophthalmic Lenses and Accessories", a Bausch & Lomb Optical Co. catalog of "Lenses, Frames, Magnifiers, and Readers" dated 1916. Also bound in hard cover with 150 pages of fine gloss paper, a historical chapter, several technological chapters with substantial commentary, photographs, charts, graphs, an extensive table of contents, and even item-by-item prices.

Both books are so fascinating that either might well be reprinted today for display as conversation pieces in optometrists' reception rooms. Quite evidently these and other companies' catalogs of similar quality were distributed gratuitously en masse to the firms' thousands of optometric customers. But how many of these books remain? I would be surprised if even a hundred now exist in the whole world. Yet these are impressive enough to grace any book shelf. Commercially sponsored publications of less professional appearance have long since vanished, I fear.

But if someone has made a hobby of collecting such items, what interesting historical concept might be derived therefrom other than the documentation of technological changes in eyewear? Well, from my own personal background in optometric academics, I would find the comparative role of industry in professional education a theme worth exploring. Surely others would discover other interesting theorems to pursue.

H.W H.

The Optics of Leonardo Da Vinci:

Drs. Robert F. Heitz and Jay M. Enoch have co-authored a paper entitled "Leonardo de Vinci: An Assessment of his Discourse on Image Formatin in the Eye" to appear in the Proceedings of the International Symposium on Visual Optics, Tirrenia, Italy, May 2-4, 1986, published by Springer Verlag, Heidelberg, West Germany. A copy of the manuscript is being placed in the International Library, Archives, and Museum of Optometry, St. Louis, MO, USA.

The authors have studied carefully Leonardo's optical and ocular discussions in Manuscript D. They point out that he "struggled with the problem of imagery in the eye...and sought to better define the seat of visual excitation." In spite of his numerous optical diagrams, analogies with the camera obscura, and his suggested analysis involving the submergence of the observing eye in water, he never seems to have understood the optics. They add, "It was impossible, of course, for Leonardo to know that the re-inversion of the image occurs in the brain."

The "21 Points" reviewed:

According to a recently received news release from the Optometric Extension Program, the "21 Point Analytical Sequence," more familiarly called the "21 points," was first presented to the profession by Dr. A. M. Skeffington as his recommended standard optometric procedure in 1929. In August of this year, 57 years later, Pacific University College of Optometry and the Optometric Extension Program jointly sponsored a Conference on Theoretical and Clinical Optometry to reexamine the long-standing sequence and to initiate clinical research to determine its relevance today. The 40 attendees of the Conference will gather data on the 21 points during the coming year and compare their results at a second conference next summer.

In a very real sense, the 21 points have become an historical as well as a clinical phenomenon. An interesting byproduct of this study could well be an assemblage of facts and documentary details outlining how Skeffington derived the sequence and its subsequent numerical modifications. Would that the participants undertake that aspect, too. Otherwise its genesis shall remain a bit mysterious.

This is the forest primeval:

These are the first five words of the beautiful epic poem *Evangeline, A Tale of Acadie*, by Henry Wadsworth Longfellow (1807-1882). The poem was a reading assignment in my early teens, some 57 years ago. The opening sentence was all I remembered, believably because I struggled with the meaning, spelling, and pronunciation of "primeval," a truly sophisticated adjective in my rural midwestern hometown.

Though reared in a community with a circumstantial lifestyle not greatly different from that of 18th century Acadia, I really could not then appreciate the sentimental depth of the poem. Perhaps that was because I was in my teens, whereas Longfellow was almost 40 when he authored the tale. Born in the Acadian periphery of Portland, Maine, only 50 years after the actual historical event, he may have had a slight cultural advantage as well.

So much for my rationalization. What prompted my very late interest in the poem was a recent vacation motoring tour through Nova Scotia, Canada, the heart of former Acadia, where many traces of the mass expulsion of a people remain. I bought the book and read the poem again, this time with incredible enjoyment and feeling.

Only one passage escaped my grasp, and surprisingly it related to a bit of visual folklore, as follows:

"Oft in the barns they (the children) climbed to the populous nests on the rafters,

"Seeking with eager eyes that wondrous stone, which the swallow

"Brings from the shore of the sea to restore the sight of its fledglings;

"Lucky was he who found that stone in the nest of the swallow!"

I hope that one of our readers may know the mystery of the wondrous stone and why finding it was lucky.

The only other reference of special optometric interest, many pages later, is a clause in description of the children's father, as follows:

"...and glasses with horn bows sat astride on his nose, with a look of wisdom supernal."

One can wonder if the Acadians of the mid-18th century really had glasses at all or if Longfellow was reflecting his own mid-19th century experience.

H.W H.

"Teary-Eyed precedents":

In 1912, Cambridge University Press printed a volume selected and arranged by Sir Joseph Larmor and James Thomson entitled Collected Papers in Physics and Engineering by James Thomson. Four hundred and eighty four pages in length and containing sixty eight papers on diverse physical subjects as fluid motion, elasticity and liquefaction, the collection served as a memorial to the long career of British physicist and engineer James Thomson (1822-1892). Older brother of the better remembered Sir William Thomson (Lord Kelvin 1824-1907), James spent most of his career in the posts of professor of civil engineering at Queen's College, Belfast (1857-73) and later at Glasgow (1873-89) where he made new advances particularly in the field of fluid dynamics. From the biographical information in the book we learn that James Thomson also introduced twenty-eight terms into the scientific vocabulary including radian (1873), interface (1874) and ergometer (1876). His active career in academics came to a close in 1889.

In the autumn, shortly before the time for returning to Glasgow, a new calamity befel Prof. Thomson, the failure of his sight. The retina became detached in the middle, with the result that in a few days he could no longer see to read and could only write with difficulty, because the part of the page before him directly in the middle of the field of view seemed always to disappear, or to become so distorted, that the words written on the paper could not be distinguished. Happily total blindness never came on; even to the end of his life he could see light and colours and could to a certain extent recognize the faces of friends. When he became more used to the deprivation of clear sight, he learned to write with a blunt black pencil on large sheets of cartridge paper, or better still, with chalk on a large slate, for his wife or one of his daughters to

copy. Dictating always seemed to be difficult to him. By the aid of a magnifying glass and by directing his eyes a little above or below the thing he wanted to examine, he contrived sometimes to study a diagram or a formula which thus had its image on an uninjured part of the retina. The immediate result of his failure of sight was that he felt obliged to resign his professorship. Under this affliction his wonderful patience again asserted itself. He never complained nor was the sweetness of his disposition ruffled in the slightest degree. He still employed his mind with scientific work, even under all the inevitable disadvantages, and took relaxation in listening to the reading aloud of literature, and continued his interest in politics. (p.87)

After James' death in 1892, his brother William submitted a paper to the Royal Society which contained notes on aspects of vision made by James. Printed below is the full content of this paper as found on page 459 of said book.

ON CERTAIN APPEARANCES OF BEAMS OF LIGHT SEEN AS IF EMANATING FROM CANDLE OR LAMP FLAMES

About the end of last January, when my brother was fully occupied in writing his paper on the Trade Winds for the Bakerian Lecture, he called my attention to the well-known beams or ladders of light seen below or above a lamp flame viewed with partially-closed eyelids, and he gave me verbally an explanation of the phenomenon which surprised me very much. By some simple and interesting trials with my own eyes, which he explained to me how to make, I was perfectly convinced that his explanation was correct; and believing it, as I still believe it, to be new, I urged him to write a short paper on the subject for the Royal Society, but not to let it interfere with his work for the Bakerian Lecture; and he undertook to do so as soon as might be after being freed from this work. We hoped, somewhat confidently, that he might be able to give the thus promised paper before the end of the present session of the Royal Society. That hope has not been fulfilled, and I had offered to the Secretaries a communication describing my recollection of what my brother had told me, when his son found a memorandum of date 18th October, 1891, and a little book of notes of date 29th December, which tell the story better than I could have told it, and which, therefore, though not completed in proper form for

publication, I now give in the unfinished form in which they have been found, with only a somewhat more clear drawing, and description of drawing, substituted for the rough sketch found in his note of date October 18, 1891.

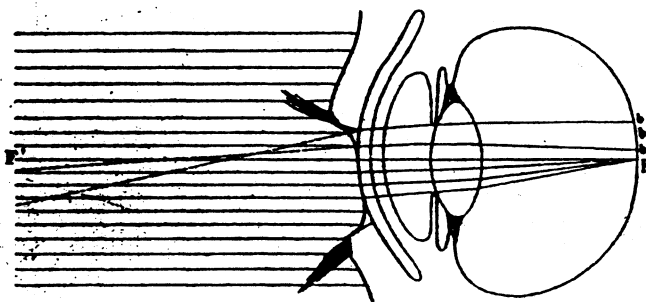
PROPOSED PROBABLE PAPER FOR THE (?) SOCIETY, BY J.T. ON THE NATURE AND ORIGIN OF CERTAIN APPEARANCES OF BEAMS OF LIGHT AS IF EMANATING FROM CANDLE OR LAMP FLAMES.'

DESCRIPTION OF THE DRAWING.

(The drawing represents a vertical section of the eye, eyelids, and watery prismoids, through FF', the axis of the eye. The large number of parallel lines outside represent rays of light coming from a flame several feet or yards away in the direction of F', to the eyelids, the prismoids, and the undisturbed outer surface of the cornea between the prismoids. The lines within the eye below FF' represent the convergence to F, the image of the flame, of those of the external rays from the flame which fall on the undisturbed portion of the surface of the cornea. The lines within the eye above FF' represent rays disturbed by the prismoid of the upper eyelid which, incident on the retina at bbb, give the perception as if of light coming from without in the direction of the dotted lines outside the eye. It is this perception that constitutes the appearance of the downward beams or ladders of light, due to the prismoid of the upper eyelid. The rays disturbed by the prismoid of the lower eyelid, in the position represented in the diagram, are all stopped by the lower part of the iris.

Looking now at the diagram, we understand perfectly that if, with the eyeball and flame unchanged, the upper eyelid be gradually raised a little, the uppermost of the rays coming inwards from the prismoid will fall on the upper part of the iris and will be stopped by this screen. Thus, the length of bbb upwards from F is diminished, until all the beams from the prismoid are stopped by the iris, and the length of the apparent beams below the flame correspondingly diminishes to zero. When the upper eyelid is wide open the flame is seen without any appearance of the beams below it. We also understand readily from the diagram how, if the lower eyelid is lifted a little without any change in the position of the upper eyelid, beams both

above and below the flame are seen. We also conclude that if, with the eyelids fixed



relatively to the head, the head is moved while the eyeball remains with its axis in the direction of the flame, we see beams of light above the flame when the head is turned upwards, and beams of light below the flame when the head is turned downwards. Also that if the eyelids are partially closed, as in the diagram, beams will be seen both above and below the flame when the head, carrying the eyelids with it, is turned slightly up from the position shown in the diagram. Also that if the eyelids be wide open, instead of half closed as shown in the diagram, no beams, either above or below the flame, will be seen when the two eyelids are equidistant, or nearly equidistant, above and below the middle of the pupil. When the head, with the eyelids, is turned downwards, so as to bring the upper eyelid across the aperture of the pupil beams of light are seen below the flame; and when the head, with the eyelids, is turned upwards so as to bring the lower eyelid across the middle of the pupil, beams of light produced by the prismoid of the lower eyelid are seen above the flame.]

NOTES ON QUASI-RAY BEAMS OF LIGHT FROM CANDLES, OR OTHER
LUMINOUS SPOTS.

Date of Note, 29th Decmeber, 1891.

I have noticed decidedly this morning to the following effect:

In some cases (the nature of which I intend to note further on) I found that, when seeing a small gas flame with apparent descending tail (or quasi beam of rays), I could, by lowering the upper eyelid, cut off vision of the flame, while leaving the tail visible; and, by still further lowering the upper eyelid, I could cut off the upper part of the tail, leaving the lower part, the part remote from the flame, quite visible as before. The contrast between lowering the upper eyelid and lowering a screen (a card, for instance) in fron of the eye was very remarkable. In the lowering of the card or other screen, the tail vanishes before th eflame is eclipsed; but in lowering the eyelid the flame is eclipsed first.

In some attitudes I could not bring out these phenomena. I did find them when awake in bed early in the morning, head on pillow and light coming down from a gas flame obliquely to the eye. Point to which eye was directed seemed to do best when taken at an altitude (angular) somewhat above the gas flame. Afterwards, this same morning, I found I could see the phenomenon when standing upright and looking at image of gas in mirror. Ray from image ascending obliquely; eyesight directed above image in looking-glass.

Again, looking at a gas flame a little above the level of the eye, I stood erect and elevated my face, directing my eyesight to above the gas; then lowered the upper eyelid and saw the downward tail remaining when the gas flame was eclipsed by the eyelid. The theory of all this is clear to me, and in agreement with what I have previously devised. - J.T.

Take notice that to get the phenomena above sketched out to show themselves, the edge of upper eyelid, where roots of eyelashes are situated, must not shadow the prismoid when the eyelid is lowered enough to cover the pupil from the direct rays of the candle or gas flame. After the candle is cut off from the pupil, the direct rays from the flame must still be reaching the prismoid. This, I think, tallies with the experimental conditions under which the tail was seen when the flame was eclipsed by eyelid. - J.T.

P.S. - Same day , 29th December. On a little further consideration I notice that the elevation of the face is of no importance. It is only the elevation of the line of special direction of the eyesight (axis of the eye) relatively to the line from flame to eye that is important. - J.T.

NOTES ON QUASI-LIGHT BEAMS
(FOR PAPER.)

Often I fail to see the apparently ascending beam above the candle or gas flame. But I find that by very nearly shutting the eye I can see the ascending beam going up very high and the descending one at same time. On bringing my open hand down from above as if to cut off the ascending beam I see the beam as if between my eye and my hand, and the flame begins to be eclipsed before the beam is cut off, or even diminished.

NOTE BY THE PRESIDENT OF DATE JUNE 16.

I had asked many friends well acquainted with optical subjects whether they knew of this explanation of the luminous beams, and all said "no" until yesterday evening, at the soiree of the Royal Society, when Professor Silvanus Thompson immediately answered by giving the explanation himself, and telling me that he had given it to his pupils in his lectures on optics, as an illustration of a concave cylindrical lens. He did not know of the explanation ever having been published otherwise than in his lectures. I have myself also looked in many standard books on optics, and could find no trace of intelligence on the subject. It seems quite probable, therefore, that, of all the millions of millions of men that have seen the phenomenon, none, within our three thousand years of scientific history, had ever thought of the true explanation except Professor Silvanus Thompson and my brother.

Further details on the conversations between Silvanus Thompson and Lord Kelvin are found in a footnote on p. 919 of Life of Lord Kelvin by Silvanus Thompson (MacMillan and Co., 1910).

I cannot forbear adding here a note of an incident illustrative of Lord Kelvin's personality, though it concerns myself. At the Conversazione of the Royal Society of June 15, 1892, Lord and Lady Kelvin were receiving their guests at the head of the staircase, and it came to the turn of Mrs. Silvanus Thompson and myself to be received. Lord Kelvin literally seized me, and hurriedly said to me, pointing to an electric glow-lamp hanging a few yards away, "Look at that lamp: now half shut your eyes: tell me what you see."" I said, "I see irregular luminous

streaks extending in somewhat oblique bundles above and below." "What are they due to?" he asked. "Oh, I have always supposed them to be due to the film of moisture at the edge of the eyelids, acting as an irregular cylindrical lens." "Who told you that? Where did you find that?" he asked excitedly. But just then a hand was laid on his sleeve, and a gentle voice behind us said, "William, there are people waiting." Later in the evening he resumed the subject, telling me how his brother, while lying in bed ill, had studied these apparent rays and given him this explanation; and he asked me whether I had written anything upon the phenomenon.

Had it not been for William Thomson's comment that in all probability through all of history only his brother and Silvanus Thompson had deduced the cause of the optical phenomenon, I would have left this blurb stand as is, but that statement hit me as possibly a bit overstated. So I did a little literature searching, as did Lord Kelvin, in sources that would have been readily available to him. My first stop was Helmholtz's Treatise on Physiological Optics which surely William Thomson would have been very familiar as he and Helmholtz were extremely close friends. As to whether William read German well I have not established except that in later life he used to tell how his father packed-up the family one summer and traveled to Germany for the sole purpose of allowing the family to become fluent in the German language. Apparently from William's story he never quite became a German scholar (Life of Lord Kelvin, p.17.) Whether he did or not appears somewhat irrelevant as Helmholtz does not refer in detail to the entoptic phenomena resulting

from the tear layer. Concerning beams of light or stripes he states only "The stripes are most pronounced near the edge of the eyelid when the lid arrives in front of the pupil, and are due to the thin concave film of moisture stretched from the cornea to the edge of the eyelid" (p.207 Part 1, Dover English edition 1962). Perhaps Helmholtz felt the above statement was sufficient and left the rest to the reader? If so, William Thomson missed it, if he read it at all.

Interestingly, another source on entoptic phenomena that would surely have been available to William Thomson was authored in English by James Jago M.D. and entitled Entoptics, with its uses in Physiology and Medicine (John Churchill and Sons, London, 1864.) This 188 page book with its seven chapters explains and illustrates entoptic phenomena better than any book I have ever seen. Chapter 3 entitled "Apparitions from Eyelashes, Eyelids, and Conjunctival Fluids" contains a discussion of the beams of light associated with a candle flame and is complete with an explanation of the cause and four diagrams.

After reading Dr. Jago's book there was no doubt that priority for the explanation of the beams of light associated with a flame did not rest with James Thomson as his brother William had thought. At the end of Chapter 3 Dr. Jago wrote a section called, "History of the Entoptics of the Eyelashes, Eyelids, and Conjunctival Fluids", the last paragraph of which is found below. Take particular note of the final sentence.

Helmholtz, in his article on Physiological Optics, extracts Listing's observations without improving upon them. He records, however, that Meyer (1853) has written on the stripes of light issuing from the tear-prism on the lids, without giving any hint of the purport of the communication, and allowing it to be inferred that he had not himself read it. I think it right to repeat Helmholtz's reference, though I have not the means, from want of access to the paper, of knowing whether it contain anything deserving quotation. If it treats of the beams of light that shoot upwards and downwards when we wink towards a candle-flame, I may mention that I had accurately explained these, in ignorance of Listing's writings, in 1848. Hence, unless this historical sketch be defective, several interesting phenomena have been left to be first described and figured by the present writer.

I would have left this story stand as is, but Dr. Jago's last sentence hit me as possibly a bit overstated.....

D.K.P.

Two more memorials:

In this newsletter we try to record every known memorial fund, award, medal, lecture, honor, or other entity intended to prolong the memory of at least the name of an optometrist or friend of optometry. This effort is of course a catch-as-catch-can procedure, as there exists no formal registry for such recognitions. Several of you have alerted us to instances which otherwise would have escaped our attention, but surely we still miss some.

The latest example was a press release calling attention to the Ralph Barstow International Award given each year at the San Jose Vision Therapy Conference, held under the auspices of the Optometric Extension Program Foundation. The late Ralph Barstow had devoted his career to advising optometrists on practice management and economics with a strong emphasis on professionalization.

Another memorial which we now record here almost three years late was the rededication of the Optometry Building at The Ohio State University as Glenn A. Fry Hall. Though technically retired, Professor Fry is still very much alive and actively engaged in research and writing in his laboratory in the building named in his honor.

Henry W Hofstetter
Douglas K. Penisten, Editors