The IU Optometry Heritage
Profile: Gerald E. Lowther, O.D., Ph.D.
Dryness and Contact Lens Wear
Glaucoma and Exercise
Vision Problems of Early Major Leaguers
From the Editor by David A. Goss, O.D., Ph.D

The concept for this publication was initially developed in the Strategic Planning Initiative conducted by the Indiana University School of Optometry in 1996-97. The purpose of this publication is to provide members of the Indiana Optometric Association, alumni of the I.U. School of Optometry, and other interested persons with information on the School and on new developments in optometry and vision care.

We plan to publish two issues in 1998: this one and one in the Fall. For this issue we asked Dean Jack Bennett to reflect on the major changes and achievements of the School of Optometry during his years as Dean. Profiled in this issue is I.U. faculty member Gerald Lowther, who also contributed a clinical review on dryness symptoms of contact lens wearers. Vic Malinovsky summarized two journal articles that should be of interest to practitioners. And in case you are looking for something different from the usual journal fare, we have an article on early major league baseball players with eye and vision problems.

Some readers with long memories may be aware that there was a previous publication named the Indiana Journal of Optometry published from 1959 to 1968. It was published by the Indiana Optometric Association and edited by members of the I.U. optometry faculty. Henry Hofstetter, Gordon Heath, and Tom Madden served in the primary editorial roles.

We are pleased to have the Indiana Optometric Association include this publication with its mailing packet. The Editorial Board and I thank the many persons who given us suggestions and encouragement. We especially thank Dean Jack Bennett for his enthusiasm and support for this project.

We are very interested in finding out whether you, the readers, feel that we are achieving our stated purpose of providing information on the School and on new developments in optometry and vision care. We are anxious to get your feedback and suggestions. Please write, call (my phone number is 812-855-5379), email (dgoss@indiana.edu), or respond at our website (http://www.opt.indiana.edu/IndJOpt/home/html).
Statement of Purpose: The Indiana Journal of Optometry is published by the Indiana University School of Optometry to provide members of the Indiana Optometric Association, Alumni of the Indiana University School of Optometry, and other interested persons with information on the research and clinical expertise and activities at the Indiana University School of Optometry, and on new developments in optometry/vision care.

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The I.U. Optometry Heritage
Reflections by Jack W. Bennett, O.D.

It is my pleasure to contribute to this inaugural issue of the Indiana Journal of Optometry. The genesis of this new journal coincides with the later stages of my ten-year term as dean of the School of Optometry at Indiana, and provides a fitting vehicle to reflect on some of the significant activities, changes, and accomplishments during the past decade — August 1988 to June 1998.

To understand and appreciate the most recent history, however, we must have a basic understanding of the history that preceded it. Under the extremely capable and productive leadership of Henry W. Hofstetter and Gordon G. Heath and the efforts of a dedicated and innovative faculty, the School attained and maintained status as a leading institution of optometric and visual science education and research in the world. Since its inception in 1952, our graduates have been recognized for their contributions and leadership in the profession of optometry and in its research and educational institutions.

Through history, the one constant was that these two leaders always satisfied the School’s mission — meeting the needs of the school, the profession, and society, and enhancing the School’s status and position of leadership within the professional and academic communities. That same constant has been the guiding force in the changes during the last ten years chronicled here.

Faculty

The IU School of Optometry has been blessed with an outstanding faculty from the beginning. Over time, normal attrition and mobility provide the opportunity for changes in a school’s faculty to meet new programmatic, professional, and scope of practice needs. These opportunities allowed early movement toward restructuring of the faculty as a unit and an impetus for the faculty as a whole to exercise its appropriate role in the management and policy-making decisions of the school.

The long standing, oft-changed, and frequently divisive departmental structure was scrapped in favor of a total faculty body managed by several faculty members who added administrative duties as associate deans in addition to their faculty responsibilities. Fluid groups of faculty could pursue academic, clinical, and service functions as dictated by need and interest. These groups, as well as various standing committees, could then bring issues to the whole faculty for policy decision.

After some early struggles as the faculty and administration settled into this new shared management, the process now seems to be serving well. Continued attrition and mobility of faculty allowed modification in the mix of faculty expertise to meet changing curricular and programmatic needs. A successful recruitment effort to fill some faculty needs has just been completed, producing four full-time and one half-time faculty who will have a significant impact on our teaching and research in new and expanded areas of expertise.

Additionally, with the significant support of the School of Optometry, the university has finally recognized the need for a different kind of faculty in the health professions schools; one whose primary role is teaching students in the clinical patient care environment. These clinical faculty will facilitate the building of a strong faculty base to conduct the very important patient care education of the students.

Activity to recruit four full-time clinical faculty is currently underway. These faculty will fill needs currently being met by combinations of temporary and part-time faculty and will significantly enhance our ability to produce outstanding clinical optometrists.

Students

The School continues to be blessed with a more than adequate applicant pool, allowing considerable selectivity in the admission process. Even with an overabundance of well-qualified applicants, active recruitment occurs to maintain a reasonable mix of Indiana and out-of-state students. In 1988 only 37 Indiana residents applied to the program, along with several hundred out-of-state students. Today, we prefer to maintain a ratio around 40-50 percent Indiana resident to out-of-state students.

Data indicate that the overwhelming factor in optometric career choice is the influence of an individual optometrist, so the School established a program to encourage local optometrists to mentor bright men and women in their communities. This effort produced an almost immediate impact and now there is a quite adequate pool of Indiana applicants in addition to an ever-growing pool of out-of-state students.

In 1988 there were few O.D.s pursuing M.S. and/or Ph.D. degrees in the school’s graduate program. Efforts including the reestablishment of the joint O.D./M.S. program have produced positive results. Currently nine of 13 graduate students are either O.D.s or in the joint degree program.
Curriculum

It was obvious in 1988 that we needed to modify the curriculum to meet current and evolving needs of optometric practice. Previously, almost all courses were adjusted in a rather piecemeal fashion, so a complete redesign was undertaken to meet today's needs. Ultimately, the School conducted a three-step process that involved the entire faculty. First the faculty was asked to forecast twenty years into the future of optometry. The second consideration was determining what the students need to know in order to practice that way. Third was the challenge of designing a curriculum to meet those needs.

The faculty was divided into “expertise and interest groups” and the study groups were asked to design organized courses. Finally the results of the group studies were coalesced by the overall curriculum committee. The new curriculum showed a 20 percent increase in the number of credit hours necessary — even though many courses were reduced in hours to reflect the changing emphasis and direction of the practice of optometry. The curriculum will be fine-tuned annually, but the basics are in place, functioning and serving the School and the profession well.

Clinics

One of the major shortcomings of the program in 1988 was the lack of adequate clinical experience opportunities for students. Alternatives were presented, including the rather draconian possibility of moving the entire School to the Indianapolis Medical Center campus for its ready access to a large and diverse patient population. Instead, some parts of the clinical experience were moved, but the basic educational aspect of the program was left in Bloomington, where its proximity to other educational programs and graduate programs would benefit other School activities.

The School didn't have the funds to purchase or construct additional clinical facilities nor was it likely that university or state funds would be forthcoming for at least 10 to 15 years.

The result was the leasing of space for the Indianapolis Eye Care Center, adjacent to the Medical Center campus, near the state government center. The new clinic's location in an urban redevelopment area, combined with ownership by an inner city minority group resulted in the attainment of grant funds reducing the cost of the building and lease costs.

But new clinical space requires expensive equipment and once again, there were no funds for such purchases. The Foley House Campaign successfully raised over $1,000,000 in contributions and gifts-in-kind, allowing equipment of the new Indianapolis clinic, a total equipment upgrade in the campus clinic and the Community Eye Care Center clinic, and an upgrade of equipment in all pre-clinic laboratories and some teaching and research laboratories. While the Indianapolis clinic still has not achieved its full potential patient load, it continues to develop into a major adjunct with a positive impact on the clinical experience of the students.

The problems of the clinic located on the second floor of the building on the campus in Bloomington were obvious: inconvenient location for patients, parking and traffic problems, and lack of mobility within the building, among others.

For years the School operated a small clinic on the west side of Bloomington, hampered only by its lack of space. The initiative from the Indianapolis clinic was therefore copied — the west side facility's owner agreed to expand that facility.

As this article is written, construction has been completed and the move into the newly expanded clinic on the west side has started. One primary care module and the ocular disease clinic are moving from campus to the newly expanded community clinic, allowing more convenient patient access. Again, no state or university funds were used. Now the campus clinic will be remodeled to increase its functionality and attractiveness.

These clinic expansions create unparalleled clinical experience for our students, offering an outstanding diversity and quality of patient experiences.

Physical Plant

The main physical facility of the School, the Optometry building on East Atwater in Bloomington, is now 30 years old and is beginning to show wear and tear. During the past ten years, we've managed major preventative maintenance on plumbing, electrical, and other infrastructure. Additionally, we've begun the process of upgrading the facility to meet current standards for classrooms, laboratories, and office space. Reconfiguring, carpeting, and painting have produced positive results in a growing number of areas in the building and will be completed as resources allow.

Particular attention has also been paid to the exterior aesthetics of the building. Landscaping,
shrubbery, flowers, and lighting have all been upgraded to meet current standards of safety, aesthetics and accessibility. Parking continues to be a problem, but the Optometry building is in good shape, functions well, and is an attractive and visible addition to the campus.

**Technology**

With the help of the school’s technology committee, some funding support from campus technology groups, and the interest and dedication of various faculty members, the School has made significant progress in embracing electronic technology.

Some eight years ago we concluded our project to put a computer on every faculty and staff member's desk, to have these computers all networked internally within the building and externally within the campus, and to gain access to external computing resources. Since the completion of that project, the hardware has been upgraded several times to reflect new developments in capacity, capability, and speed. Additionally considerable resources in personnel in the form of programmers, computer technicians, network managers, etc., have been committed.

This infrastructure has piqued the interest and activity of a number of faculty who have developed a growing collection of computer-assisted instructional material for various classes, laboratories, and clinical activities. This activity produced the need for a computer classroom cluster where all optometry students have computer addresses, access, and considerable academic assignments involving computer use with classroom and laboratory material.

The availability of infrastructure and support services in these areas have resulted in the web site of several national professional organizations being maintained at the school and the production of computer interactive teaching and learning materials in a variety of subject areas are being produced and distributed worldwide.

**Research**

Of all the essential activities of the School of Optometry, research is the most difficult to influence or impact since it is so dependent on individual faculty initiative. An institution can provide incentives, support, encouragement, facilities, and equipment, but productivity depends ultimately on the individual motivation of each faculty member.

By traditional measures of research activity (dollar volume of external funded grants) the production of the School’s faculty is less than what seems warranted. Funds for summer appointments to develop projects, travel and equipment for the same purpose, and research equipment purchases, with some notable exceptions, have produced disappointing results.

Financial support over the past four or five years has grown to where support for research and the graduate program exceeds 20% of the current School of Optometry budget, sans clinic income. This has occurred in the face of decreased support from the university’s office of research and graduate programs in the past year or so.

There are however, positive developments and signs of improvement in the research productivity of our faculty. The 1994 establishment of the Borish Center for Ophthalmic Research, the first such program in the country designed to facilitate clinical trials and other more practically oriented research activity, has produced positive results. The new faculty coming on board all are either veteran researchers or show great promise.

The upgrading of the fourth floor research labs and assisting with start-up equipment and travel funds and expansion in other research areas will continue. All legitimate and reasonable requests for necessary support for research activities will be accommodated as has been true in the past. Hopefully, the new dean will be able to see increasing returns on these past and present investments in research.

**Relations with alumni, the profession, and its organizations**

Relationships with alumni have improved considerably over the past ten years due to activities including alumni receptions at major national and international meetings, routine visits by the dean to local optometric societies in the state of Indiana, and the development of alumni homecoming activities.

Alumni and professionals have become more involved in school activities, including the successful completion of the Foley House fundraising campaign and the recent inauguration of the Endowment Campaign. The new Endowment Campaign aims at raising $3 million in endowed funds to support a Henry Hofstetter Professorship, the Borish Center for Ophthalmic Research, and student aid and assistance through fellowships and scholarships.

The premise that this is a professional school and cannot be separated from the profession is an operational truism. Increasing numbers of faculty
members are active in organizations including numerous committee chairmanships, memberships, and elective offices in the Indiana Optometric Association, the American Optometric Association, the American Academy of Optometry, the American Optometric Foundation, the National Board of Examiners in Optometry, etc.

Through joint faculty and student activities the school has become increasingly active in community and philanthropic endeavors. The students, due to the implementation of various programs including the Capstone Seminar and the Dean's Student Advisory Committee, are leaving the institution on graduation with warm feelings. This translates into positive impacts on future fundraising and future support from alumni and professional organizations.

**Financial Status**

As a result of the diligent efforts of the Budget and Finance Office the School of Optometry is in excellent financial health. While not extravagantly so, it is able to meet its obligations and provide support to do what must be done.

The school has consistently been able to provide a slightly greater salary increment for our faculty and professional staff than that granted by other academic units on the campus. Additionally it has been able to address identified faculty salary inequities. The school has secured equipment far beyond its financial capabilities through the good efforts and bargaining powers of our purchasing personnel. It is positioned to see continuing growth in clinic income and hopefully in indirect cost recovery on grants. In summary, while the School is certainly not "well to do", it can be classified as comfortable and secure.

**Summary**

When I arrived here as dean in August, 1988 I came home to an institution with a rich heritage based on the strong leadership of my two predecessors. It was an institution of significant national and international repute. I hope that history will judge that during my tenure as dean I have been an able caretaker of that legacy and have left a stronger foundation upon which the faculty and the new dean can continue to build and prosper.

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*Dean Bennett and his wife Alice greet University Chancellor Herman B Wells and aide, Joe Jefferson, at a May event celebrating Bennett's tenure as Dean of the School of Optometry.*
Profile: Gerald E. Lowther, O.D., Ph.D. by David A. Goss, O.D., Ph.D.

How can dry eye symptoms be alleviated? What is the best way to manage keratoconus? Will newer high Dk materials lead to safer extended wear contact lenses? How can computer technology be used to disseminate information on contact lens fitting and care?

These are just some of the questions being addressed by Indiana University School of Optometry faculty member Gerald Lowther. Jerry joined the I.U. faculty in 1994 after several years on the faculties of Ohio State, Ferris State, and University of Alabama Birmingham.

Jerry is originally from Lancaster, Ohio. The seeds of his optometric career were sown when Jerry’s machinist father advised him to seek work in which he could be his own boss. By his senior year in high school, Jerry had it narrowed down to veterinary medicine or optometry. Lucky for us he chose optometry.

Jerry attended both undergraduate and optometry school at The Ohio State University, completing his O.D. degree in 1967. He practiced optometry for about a year and a half in Newark, Ohio, with Phil Haynes, author of the Encyclopedia of Contact Lens Practice, then returned to Ohio State for graduate school. He earned an M.S. degree in physiological optics in 1969, and a Ph.D. in 1972. His graduate research work in contact lenses and corneal physiology was under the direction of Richard Hill. Other optometric luminaries who influenced Jerry in optometry school and graduate school were Glenn Fry, Bradford Wild, and Boyd Eskridge.

Jerry stayed at Ohio State to serve on its faculty for five years. In 1977, Jerry joined the faculty at Ferris State, where he was Professor of Optometry and Director of the Contact Lens Clinic for 12 years. He then taught at the University of Alabama-Birmingham for five years, and served as Associate Dean of the School of Optometry for three years. Jerry decided to come to I.U. in 1994, because of its stature as one of the leading optometry programs, and because of the opportunity to return closer to his Midwestern roots.

Jerry has authored three books, ten book chapters, and numerous research papers on contact lenses and corneal physiology. In this issue Jerry outlines his current research on the sources and management of dry eye symptoms in contact lens wearers.

He is also seeing keratoconus patients in Bloomington and Indianapolis for the CLEK (Collaborative Longitudinal Evaluation of Keratoconus) Study, a multi-center study of the clinical course of keratoconus. In addition, Jerry has been working with two contact lens companies that are developing high Dk contact lens materials with the goal of achieving safer daily and extended contact lens wear.

Jerry is also interested in the adaptation of computer technology for teaching purposes, developing interactive multimedia educational CD-ROMs. The CDs integrate text, photographs, movies, and voice into educational modules that can be studied at one’s own pace. The first in a series of CDs on contact lenses has been produced, and covers basic contact lens fitting procedures, keratometry, corneal topography, biometrics, prefitting examination, selection of lens type, as well as placement and removal of a contact lens. It is being distributed by Vistakon to all optometry students internationally and to interested practitioners. Information on these CDs is available on the world wide web at www.opt.indiana.edu/lowther/cdrom.html. In addition to the contact lens CD series, Jerry and Irv Borish are producing a CD on refractive techniques for Essilor France.

Jerry serves the optometric profession in many ways. He is currently president of the American Academy of Optometry, and co-director of I.U. School of Optometry’s Borish Center for Ophthalmic Research. For 18 years he has been editor of the International Contact Lens Clinic journal. He is a past president of the International Society for Contact Lens Research, a “think-tank” group of about 100 contact lens investigators from many different disciplines. Jerry is also serving as an advisor for the development of new optometry schools in Poland and China.

In what little spare time he has away from optometry, Jerry likes photography, woodworking, scuba diving, and travel. His wife, Andrya is a part-time faculty member in the School of Optometry. Jerry’s daughter, Karen, is attending University of Alabama Birmingham, and his son, Dan, is a student at the University of Colorado.

Jerry believes academic optometrists should build knowledge through research, help develop well-trained practitioners who will continue learning, and be involved and take leadership roles in professional organizations. It is clear that he lives up to his philosophy.
Can Anything be Done to Alleviate Dryness Symptoms with Contact Lens Wear? by Gerald E. Lowther, O.D., Ph.D

As all eyecare practitioners know, many patients complain of symptoms associated with dry eye, including grittiness, irritation, mild pain, episodes of excessive tearing, and other minor symptoms. These are so common that we often just dismiss them as normal or something we do not do anything about unless the symptoms are severe enough that the patient demands help. Some practitioners tend not to even question patients about such symptoms.

Dryness symptoms are probably the number one complaint of hydrogel lens wearers, with anywhere from 20 to 50% of the patients having such complaints at least part of the time. Due to the widespread nature of the dryness symptoms, I have spent a considerable amount of my research efforts on this problem.

For some patients, there are obvious causes of the symptoms, as for example, meibomian dysfunction and/or blepharitis. The positive effects of warm compresses and lid scrubs are sometimes quite surprising. For some contact lens patients, just using a clean lens or a different lens alleviates the problem.

However, a large percentage cannot be helped with such simple approaches. Symptoms due to a true lack of tear volume, as is so common with the aging population, are more difficult to alleviate. Tear supplements give temporary relief, but the symptoms often return in 15 to 20 minutes because they are washed from the eye quickly. Many companies have spent millions of dollars trying to develop solutions that are retained longer. Repeated use of these supplements may aggravate the problem.

One of my first studies into this problem investigated whether temporary collagen punctal plugs would alleviate the dryness symptoms with hydrogel contact lens wear and predict whether permanent plugs would be helpful. However, due to the response of a couple of the wearers with dryness symptoms.

Only one eye received the collagen plugs in both the upper and lower puncta. However, the patients thought that plugs had been placed in the puncta of both eyes. The results were surprising in that the majority of patients (Figure 1) indicated that their symptoms were reduced or alleviated in both eyes. There was a large placebo effect. However, a couple of patients remarked during the follow-up visits that they did not know what we did but it certainly worked on one eye and not the other one. They had correctly indicated the eye that had been plugged. Other studies about this time were showing that the collagen punctal plugs had little if any effect on decreasing the tear outflow.

Based on the results of the above study, we concluded that collagen plugs were not a reliable test, at least with contact lens patients, of whether permanent plugs would be helpful. However, due to the response of a couple of the patients where collagen plugs apparently had sufficiently decreased tear outflow, we felt a study with permanent plugs was indicated. The permanent plugs do a much better job of preventing tear outflow. Therefore, we designed a second study similar to the first one, except that we used Herrick permanent plugs. The insertion of a Herrick punctal plug is illustrated in Figure 2.

These silicone plugs are placed down into the canalici and are not visible. With 35 hydrogel lens wearers, we placed the plugs in both the upper and lower puncta of one eye but did sham procedure on the other eye. The patients again though
that we had plugged both eyes. In this case we found a significant number of patients who had a marked improvement in symptoms in the plugged eye (Figure 3).

There were a couple of surprising results with the silicone plug study. The first was that a significant number of the patients reported bothersome epiphora for the first three to five days in the eye that was plugged. After the first few days this epiphora was no longer present. This study was only a four week study in which the patients did not use rewetting drops with an additional week during which they did use rewetting drops.

By the end of the four weeks, many of the patients had a return of many of the symptoms. In other words, the effect of the plugs was decreasing. It was felt that the plugs were still in place, because in each case in which the patient wanted the plugs removed at the end of the study considerable force was required to irrigate the plugs out.

Based on the above study, Alan Tomlinson and I designed a study to investigate further the presence and nature of this feedback system in effect. If there are more tears than normal, then there is feedback telling the lacrimal system to produce fewer tears. The nature of this feedback system is not known but may be a neurological system. We know that any stimulus to the anterior ocular surface causes tearing, and that under general anesthesia and during sleep tearing diminishes to almost zero.

One of the major symptoms of dry eye patients is periods of excessive tearing as a response to the drying symptoms. The irritation from the dryness causes pain that results in excessive tearing. This shows that the lacrimal system is capable of producing more tears than are usually produced by the dry eye patient.

The above studies bring up the question of the long-term effect of occluding the lacrimal outflow on patient symptoms. Is it possible that for many marginal dry eye patients that the cause is neurological rather than a lack of ability to produce tears? If so, does this mean that plugs may only work for a short time and then the system readjusts back to the original, insufficient tearing level because of the “neurological set” of the patient?

A number of studies still need to be done with the permanent plugs. These include well-designed long-term studies with both marginal dry eye patients who are not contact lens wearers, as well as a study with contact lens patients with drying symptoms. Will the plugs have any positive effect over months or will the symptoms return even with the plugs?

An advantage of the plugs, even if the tearing levels decrease over time, might be that artificial tears become more effective because they are retained on the eye longer. This alone could be a very positive effect and good reason to use the plugs. Further study into the neurological system controlling the level of tearing may be more important in the long term in finding a solution for many dry eye patients. We hope to continue with some of these studies.

We have also studied the effects of some new hydrogel polymers on dryness symptoms. Along with Renee Reeder and Lance Haluka, I did a double masked study comparing SureVue, as the control lens, to the Benz-G 5X and the Biocompatibles ProClear lens. Each patient wore one pair of a SureVue/Pro Clear, SureVue/Benz-G 5X, and Benz-G 5X/Pro Clear in a random sequence.

Neither of the new lenses, which are reported to decrease dryness symptoms, performed any better than the control. This is contrary to other reports. The difference could be that the other studies were not double masked and as we saw with the collagen plug study, the placebo effect can be very large. The manufacturing of the lenses could be a factor, because the Benz lenses were manufactured in a different laboratory than lenses used in previous studies with this.
Clinical studies are ongoing with a couple of high Dk hydrogel materials that are not yet on the market. Since the present hydrogels have relatively low oxygen transmissibility, considerable edema is typical with overnight wear. This is probably one reason extended wear lenses create problems with many patients. With limited experience using these lenses, it appears that the complications with extended wear may be less and longer extended wear may become safer. However, more experience with these lenses is required. An unanswered question with these materials is the effect on dryness symptoms. Future studies on dryness symptoms with these lenses are planned.

From studies conducted and clinical experience, my approach to the management of patients with drying with symptoms with hydrogel lens wear is:

1. Be sure that they have clean lenses.
2. Consider changing solutions if the patient is using a system with preservatives.
3. Put the patient on warm compresses and lid scrubs if there is the slightest indication of a blepharitis or meibomian gland dysfunction. Use the compresses first followed by lid scrubs. If there is marked meibomian gland dysfunction, express the glands in office.
4. Consider using a thicker lens design, most commonly in a low water content, FDA group I material. (Lens thickness appears to be more important than water content)
5. Use a prism ballasted lens. The lens shape and/or thicker base seems to help alleviate symptoms in some cases.
6. Use permanent punctal occlusion.

More detailed information on the problem of dryness with contact lens wear can be found in my book, Dryness, Tears, and Contact Lens Wear, published by Butterworth-Heinemann.

References

Eye Opener:  *Eye and Vision Problems of some Early Major League Baseball Players* by David A. Goss, O.D., Ph.D

Keep your eye on the ball. That’s an adage every Little Leaguer learns. Early baseball players didn’t have the advantages of contact lenses, polycarbonate lenses, and other aspects of the quality of eye and vision care that athletes have today. However, there were some early players that persevered despite the obstacle of poor vision.

The first major league baseball player to wear spectacles on the field was right-handed pitcher William H. White. He played in the early major leagues from 1877 to 1886, and led the American Association in wins in 1882 and 1883. Following the end of his baseball career, White studied to become an optician and founded the Buffalo Optical Company, which is still in business in Buffalo, New York. After White quit playing baseball, it would be another 29 years before another spectacle lens wearer would play in the major leagues.

**Lee Meadows**

Lee Meadows was the first twentieth century major leaguer to wear glasses on the field. He pitched for the Cardinals, Phillies, and Pirates from 1915 to 1929, compiling a lifetime 188 wins and 180 losses and a 3.38 career earned run average. He led the National League in games pitched in 1916 with 51, and tied for the league lead in wins in 1926 with 20 and complete games in 1927 with 25. Meadows wore spectacles throughout his major league career. Probably because spectacle lens use by ballplayers was so unusual at the time his nickname was "Specs." Meadows must have been myopic, because his eyes appear small through his spectacle lenses in close-up photographs.

The minus lenses used at that time were very thin glass lenses, and much more prone to breakage than the lens materials of today.

Perhaps for that reason it has been reported that he was warned that baseball was "a brave but foolhardy career choice for one so 'afflicted.'" In 1920 he had his lenses shattered by a batting practice foul ball, but he was not injured permanently.

**Carmen Hill**

Carmen Hill pitched in the majors parts of ten seasons from 1915 to 1930. His first major league appearance was late in the 1915 season. He was the next twentieth century major league player after Lee Meadows to play in spectacles. In his major league career he had 49 wins and 53 losses and a 3.44 earned run average. Twenty-two of his 49 wins were in 1927 and 16 were in 1928. When he and Lee Meadows were teammates on the pennant winning 1927 Pittsburgh Pirates, they combined for 41 victories. Hill had a long minor league career, during which he won 102 games, lost 162, and had a 3.38 earned run average. Hill played for six years in Indianapolis, and made his home

*Figure 1. Carmen Hill (left) and Lee Meadows, teammates on the Pittsburgh Pirates. They were the first two twentieth century major league players to wear glasses on the field (Photo courtesy of the National Baseball Hall of Fame and Museum).*

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Based on photographs of Hill it appears that he was nearsighted, but probably not as nearsighted as Meadows. Hill started wearing glasses at the age of 14 years. He had glasses broken playing ball on at least three occasions. One time a baserunner in a run down between third and home hit Hill in the face and shattered his glasses. Another time his best glasses were broken, and he had to start a game for the Pirates in Chicago wearing a pair of pince-nez glasses. He reported that they fell off about every other pitch. They fell off again with two outs in the fifth inning and the Pirates leading. He went to pick them up and stepped on them and broke them. He left the game at that time, and because he didn’t complete five innings, he didn’t get credit for the win.5,6

George “Specs” Toporcer

George Toporcer was the first infielder in major league history to wear glasses on the field. He was not allowed to try out for his seventh grade baseball team because he wore glasses. At 14 years of age he quit school to go to work when his father died. He was scouted when playing semipro baseball, and broke in with the St. Louis Cardinals in 1921 at the age of 22 without having played a game of high school, college, or minor league ball.7 In eight years as a utility infielder with the Cardinals he has a career batting average of .279. His best year was 1922 when he had a .324 batting average and 25 doubles in 116 games. After leaving the majors, he played second base on four consecutive International League pennant winning teams with Rochester, winning the International League Most Valuable Player award in 1929 and 1930. One year his team recorded 225 double plays.8 For his playing and managing Toporcer was named to the International League Hall of Fame. Toporcer also wrote a well-received baseball instructional book.

From photographs it appears that Toporcer had a moderate to high amount of myopia. Like Meadows and Hill, he had the nickname "Specs." He is reported to have broken his glasses several times on bad bounce ground balls. In his early fifties he went blind, after unsuccessful operations for retinal detachments.9 He lived to be 90 years old, often appearing as an inspirational speaker.10

George Sisler

George Sisler was one of the earliest inductees into the Baseball Hall of Fame. His records may have been even greater if he had not had an eye problem. Branch Rickey, Sisler’s college coach at Michigan and a long time major league baseball executive, considered Sisler to be the best player he had ever seen. Ty Cobb called Sisler the nearest thing to a perfect player.11

Each year from 1917 to 1922 Sisler was in the top four in batting average and in the top five in stolen bases in the American League. In 1920 he led the league in hitting with a .407 batting average, led the league in total bases, and had 257 hits. The 257 hits is a record that still stands. In 1922 he hit .420, leading the league in batting average, runs, hits, triples, and stolen bases. On top of that he struck out only 14 times in 586 official at bats. At the end of the 1922 season he was 29 years old and had a career .361 batting average. It looked like he had more phenomenal seasons ahead of him.

In the winter of 1923 he had a serious case of the flu which spread to his sinuses. He was reported to have had eye problems and double vision as a result of the sinus infection. I think that the sinus infection may have affected one of the nerves which innervate the extraocular muscles. I based this assertion on quotations such as the following from an April, 1923 newspaper story: "...an eye specialist, treating Sisler, said that he could not fix the date Sisler’s recovery could be expected, adding that the star’s vision was ‘normal in each eye.’ He emphasized the word ‘each.’ The oculist refused to amplify the later assertion. There has been an unverified report that Sisler is ‘cross-eyed.’..."12 Damage to the innervation to the extraocular muscles would be consistent with normal visual acuity and diplopia.

Apparently no physician treating Sisler came right out and stated exactly what his eye problem was to the press, but one staff member at the Washington University School of Medicine in St. Louis said the following when questioned about Sisler: "The paranasal sinuses are cavities hollowed out in the bone ... of the skull. They are placed so as to be in close relation to the muscles and nerves of the eye. Inflammation in these cavities may be, under suitable conditions, followed by inflammation and loss of function of any of the muscles or nerves of the eye. This may be either
temporary or permanent. Some sources say that the infection affected his optic nerve, but it must have been the oculomotor, trochlear, or abducens nerve based on the presence of normal monocular visual acuities and diplopia.

Sisler was out all of the 1923 season. His batting statistics after that were respectable, but not as lofty as they had been. When he returned in 1924 he had a .305 batting average. After that he had three more seasons of over 200 hits, and four seasons with batting averages between .326 and .345, but he was quoted as saying that he "...didn't consider that real good hitting." He finished his major league career in 1930 at the age of 37 with 2,812 hits and a .340 batting average.

I have not read anywhere about Sisler complaining about his eyes affecting his hitting, but if the nerve damage was permanent it would certainly affect his ability to effectively track pitched balls. Yankee pitcher Bob Shawkey recalled the following: "When he came back, we soon learned something....When he was up at the plate, he could watch you for only so long, and then he'd have to look down to get his eyes focused again. So we'd keep him waiting up there until he'd have to look down, and then pitch. He was never the same hitter again after that." It is intriguing to speculate what statistics he might have amassed if he had not had the eye problem.

Charles J. "Chick" Hafey

Chick Hafey was the first major league outfielder to wear glasses on the field. He played with the St. Louis Cardinals from 1924 to 1931 and with the Cincinnati Reds from 1932 to 1935 and in 1937. Due to injuries, an ulcer, a chronic sinus condition, and eye problems, he had only seven seasons in which he played more than 100 games. He had 1,466 hits and a .317 batting average in 1,283 major league games. He started wearing glasses at the beginning of the 1929 season. He won the National League batting title in 1931 with a .349 batting average, becoming the first major league batting champion to play in glasses. In 1971 he was inducted into the Baseball Hall of Fame. In addition to being known for hitting blistering line drives, Hafey was fast and had a strong arm. When asked if he could remember a player who could match Willie Mays for all-around excellent play, Hall of Famer Paul Waner answered Chick Hafey.

It is unclear exactly what Hafey's eye problem was based on the symptoms reported in books and magazines. Perhaps he had more than one eye problem. A teammate was quoted as saying that Hafey could not read the large signs in railroad stations without his glasses, which suggests myopia. Hafey was quoted as saying that once he got glasses he could go to a movie without getting a headache. The headaches without correction suggest something other than simple myopia, perhaps myopic astigmatism. Apparently his vision was worse in his left eye. His vision was said to fluctuate so much that he had three different pairs of glasses, also suggesting he had something more than simple myopia. The fluctuating vision could suggest that he had diabetes, but I have not found any mention of him being diabetic. His fluctuating vision and the fact that his vision seemed worse in bright light suggests that he may have had a tear film problem, a corneal problem, or perhaps severe allergies. Hafey later recalled that his vision was worse when his sinus problem was most bothersome. I have corresponded with Hafey's son, but he was unable to shed any light on his father's eye problem. Whatever the exact nature of Hafey's eye problem may have been, it must have limited his effectiveness.

Comments

Norman Plitt was the only other major league player between 1910 and 1919 in addition to Lee Meadows and Carmen Hill to wear glasses. The number of players wearing spectacles increased each decade until it reached a peak in the 1970s. In the 1970s there were more than a hundred bespectacled players who began their major league careers. The frequency of spectacle lens wear among major leaguers appears to be decreasing again in recent years, perhaps due to the use of soft contact lenses.

Today we can admire the early 20th century players who wore glasses or had eye problems for their perseverance despite broken lenses and admonitions not to play baseball. We can only guess what people will be saying fifty or a hundred years from now about the eye and vision care of today's athletes.

References


Figure 3. Chick Hafey, who won the 1931 National League batting title wearing glasses (Photo courtesy of the National Baseball Hall of Fame and Museum).
Articles of Interest:  Reviews by Victor E. Malinovsky, O.D.

Throw Away Your Glaucoma Medications and Jump on the Exercise Bike? Not Really!

I recently read a very interesting article entitled "Exercise training can reduce resting intraocular pressures in open angle glaucoma patients," which was written by Imran Ahmad Qureshi of Rawalpindi, Pakistan, and published in the Annals of Ophthalmology (1997; 29-296-301).

This study assessed the effects of exercise training on resting intraocular pressure. Unlike previous studies on exercise and IOP, this study controlled for age, duration of exercise, diurnal variation, and other factors which can affect IOP.

The study subjects were sedentary men with a mean age of 50 years. They had primary open angle glaucoma which had been diagnosed within the previous two to three years. All the subjects had been receiving the same glaucoma medication, which was not taken for one week before the study began. Resting blood pressure, heart rate, and IOP were measured following a 20-minute rest period in the supine position.

The subjects then performed an exercise test which involved running as fast as they could until they were exhausted, after which IOP was measured again. IOP decreased an average of 9.9 mmHg as a result of the exercise. The subjects were then divided randomly into an experimental group which participated in a 16-week supervised program that involved riding an exercise bicycle at 80% of their maximum rate four times per week. The remaining subjects did not exercise.

Results in the exercise group, resting IOP was 6.4 mmHg (20.5%) less than it was prior to the exercise program, while in the control group it remained nearly the same. The lower resting IOP that was seen after exercise training gradually returned to pretreatment levels after a mean of 27 days of refraining from exercise.

My Personal Comments

This study showed a decrease in IOP as a result of acute exercise, as well as a decrease in IOP as a result of the improved physical fitness gained from a 16-week exercise program. Previous investigators - including a team of investigators at the I.U. School of Optometry, I.U. School of Medicine, and I.U. Department of Ophthalmology - have found a decrease in IOP in glaucoma patients immediately after intense exercise. In some of the other studies, the maximum decrease in IOP varied between 18 and 51%. Because aerobic exercise decreases IOP, and post-exercise recovery time differs from one patient to another, it would seem reasonable to advise a patient not to exercise or do any strenuous work during the day of an eye and vision examination.

The study reviewed here concluded that physical fitness plays a very important role in the determination of IOP, and needs to be controlled in future research on glaucoma management. The physiological mechanisms of the decrease in IOP with exercise training are not understood. Although this article may suggest an alternative nonpharmacological management of glaucoma, one word of caution is that individual IOP readings were not given in the paper. Perhaps some patients did not respond at all to the exercise and others may have responded significantly. It will be interesting to see whether future studies find that better control of glaucoma could be another benefit of regular exercise.

To Be Dilated or Not to Be Dilated – Can This Still be a Question?

A recent article in the Archives of Ophthalmology (1997;115:1179-84) by Batchelder et al. will surely raise some eyebrows. Just when most of us have accepted the fact that routine dilated fundus examination (RDFE) is the standard of care, this article takes issue with the cost effectiveness of RDFE. Based on their review of records at the Kaiser Permanente Medical Care Program in northern California, the authors suggested that RDFE is not cost effective in improving visual outcomes. The guideline examined in this study was that RDFE should be performed if it had not been done within two years for patients 65 years of age or older, within four years for patients 40 to 64 years of age, and within five years for patients 20 to 39 years of age. The patient base was 265,783 persons aged 20 years or older examined in a six month period in 1992-93. Approximately 190,600 of these patients had undilated fundus examinations.
Results
The authors found 207 patients with vision threatening peripheral retinal disorders, 127 of which were excluded for a pre-existing diagnosis. Of the remaining 80 cases, the diagnosis was retinal detachment in 74 and uveal or metastatic tumor in 6. The retinal detachment cases were reviewed for evidence of any pre-existing lesions that may have been detected by RDIF, which in turn may have led to treatments which may have prevented the retinal detachments. The clinical findings in the 80 cases suggested that 42 could not have been prevented. The authors then estimated that preventive treatment would have been successful in 10% of the remaining 38 potentially preventable cases, for a total of 3.8 cases that would have been prevented. Based on these results, the authors estimated that 50,000 RDIFs would have been required for the prevention of every one case. Then based on an estimated cost of a dilated fundus examination of $10.40 for an ophthalmologist and $8.25 for an optometrist, they estimated the cost to be $433,000 for each prevented case.

The Authors' Interpretation
The authors concluded that “Routine dilated examination is an expensive test per prevented case. Published clinical guidelines lack evidence for its use.” The authors were quick to state that dilated fundus examination is certainly indicated when there are symptoms of unexplained vision loss, when various risk factors are present, or when undilated pupils result in a poor view of the posterior pole. If these conditions are not present, the authors believe that the likelihood of preventable vision loss is very low.

My Personal Comments
I would like to take issue with the authors’ conclusions. 1, for one, feel that RDIF should remain as part of our comprehensive examination for the following reasons: (1) RDIF is considered to be the standard of care by many authorities. (2) The adage that “It’s not rare if it’s in your chair,” would seem to apply here. I think that the occasional detection of an asymptomatic retinal detachment or tumor overrides the issues of cost and time. (3) Asymptomatic posterior pole lesions and conditions, such as glaucoma, diabetic retinopathy, and age-related macular degeneration are often difficult to diagnose without dilation and stereoscopic viewing. The detection of macular swelling associated with diabetes or retinal swelling associated with an eccentric subretinal neovascular membrane, or detection of the full extent of optic nerve cupping or the focal loss of the rim can be very difficult without stereoscopic viewing. (4) Routine performance of dilated binocular indirect ophthalmoscopy improves confidence in the procedure and increases the ability to perform it effectively. (5) Often patients do not report all their symptoms or do not report symptoms in such a way as to make them easily recognizable as real visual symptoms. (6) Quality care considerations should determine examination protocols, not cost and time.

News from the IU School of Optometry

New Faculty
Indiana University School of Optometry recently hired four highly regarded faculty members. Susana Chung, PhD and Shaban Demirel, PhD, two new young faculty members, arrived on campus in December; Donald Miller, PhD, joined the faculty in February; and Graeme Wilson, PhD, arrived in March. This issue will focus on introducing these four outstanding individuals.

Dr. Susana Chung received her professional diploma in optometry from Hong Kong Polytechnic in 1987, her master’s of science in optometry from University of Melbourne, Australia in 1991, and her PhD in Physiological Optics from the University of Houston in 1995. She did post-doctoral research in low vision at the University of Minnesota in 1996. Her primary teaching and research interests are in various aspects of low vision.

She has been the recipient of over 20 scholarships, fellowships or awards, has published and lectured extensively. Susana is a Fellow of the American Academy of Optometry.

Dr. Shaban Demirel received his bachelor of optometry in 1989 and PhD degree in 1995 from the University of Melbourne, Australia. He did post-doctoral research in the optics and visual assessment laboratory at the University of California, Davis.

His primary teaching and research interests are in visual function and posterior eye disease. He was a lecturer in the optometry program while at the University of Melbourne. He has published several journal articles and provided numerous continuing education courses.

Dr. Graeme Wilson received his optometric education in Scotland at what is now Glasgow Caledonian University. He served two years in the Royal Air Force, and three years with the British Antarctic Survey of which a year and a half was in the Antarctic. He completed an M.Sc. degree at the University of Manchester Institute of Science and Technology and a Ph.D. at the University of California at Berkeley in 1972. That same year he went to the School of Optometry of The University of Alabama at Birmingham (UAB). In 1980 he became Chairman of the Department of Physiological Optics and Director of
the Graduate Program in Vision Science at UAB. He served in these administrative positions for 15 years.

Dr. Wilson’s major research interest is in the surface of the eye. This includes understanding how cells of the cornea react to the presence of a contact lens.

Among his numerous awards and honors include the prestigious Max Schapero Memorial Award of the Section on Cornea and Contact Lenses of the American Academy of Optometry, and the University of Houston College of Optometry Award for Distinguished Research on the Cornea and Contact Lenses. He was the first optometrist to serve on the Program Planning Committee of the Cornea Section of the Association for Research in Vision and Ophthalmology (ARVO). At UAB he received continuous funding from the National Eye Institute from 1979 until his departure in 1998. This has included a research grant, and grants to support graduate students and optometry students interested in vision research.

Dr. Donald Miller received his Bachelor of Science degree in applied physics from Xavier University. While there during the summer of his junior year, he was a Summer Student Fellow in the Ocean Engineering Department at the Woods Hole Oceanographic Institution in Woods Hole, Massachusetts. He pursued his doctorate at The Institute of Optics at the University of Rochester, where much of his doctorate research was conducted in the Center for Vision Science. He continued on at the Center for Vision Science as a postdoctorate.

In 1996 he started a year and a half appointment as a National Research Council Research Associate in Electro-Optics Sensor Technology Branch at Wright-Patterson Air Force Base in Dayton, Ohio. His research interests are in high-resolution fundus imaging, assessment and correction of ocular aberrations, ophthalmic optics, and the general application of advanced optical techniques to vision-related problems.

Indiana University School of Optometry involvement in the American Academy of Optometry

No other optometry school can match the participation of the Indiana University School of Optometry at the American Academy of Optometry (AAO) meeting in San Antonio this past December. First, there were over 20 IU Optometry faculty who presented courses, papers or posters. In addition:

Larry Thibos, PhD, was given the Glenn A. Fry Award, one of the most prestigious awards given by the AAO. This award is given to recognize a distinguished scientist for his ongoing research contributions by inviting the recipient to present a special paper at the annual meeting of the AAO.

Carolyn Begley, OD, MS, was given the Garland W. Clay Award as lead author for publishing the most significant paper on clinical optometry in the journal Optometry and Vision Science, which is published by the American Academy of Optometry.

Three Indiana University School of Optometry faculty presently hold key positions in the American Academy of Optometry: Gerald E. Louther, OD, PhD, is the president of the AAO; P. Sarita Soni, OD, MS, is the president of the American Optometric Foundation which is affiliated with the AAO; and Victor Maloney, OD, is the chairman of the Ellerbrock Memorial Continuing Education Program Committee of the AAO.

More information regarding Indiana University School of Optometry’s participation in the American Academy of Optometry can be obtained at the website, www.aaopt.org.

Other Items of Interest from the IU School of Optometry...

Doug Freeman, MA, MLS, the IU Optometry librarian and immediate past chair and archivist of the Association of Vision Science Librarians, was the editor of the fall, 1997 edition of the journal Optometric Education which surveyed American optometric libraries.

Theodore Grosvenor, OD, PhD, retired from teaching at IU at the end of the fall semester. Dr. Grosvenor has had a distinguished academic career in optometry. Among his many accomplishments, he founded the optometry school in Auckland, New Zealand, authored nine textbooks, received numerous awards and has had an active research program. He has taught in six different optometry schools, including IU from 1974-1977. He retired from the University of Houston before returning to Indiana University in 1990. This spring he returned to the University of Auckland for three months as a visiting professor involved in teaching and research. He continues to work on various writing projects.

Student VOSH advisor, Doug Horner, OD, PhD, helped with final details for the fourth humanitarian mission to Guanajuato, Mexico which left March 7 and returned March 14. Thirty students made up the majority of the 44 participants who served the estimated 4000 patients needing care. The trip was made possible with a substantial commitment from SOLA Optical, gifts from alumni and other friends, and donations from Vistakon and Sunsoft.

Edwin Marshall, OD, MS, was recently elected to the Governing Council of the American Public Health Association and appointed chair of the admissions committee for the new graduate program in public health at IU. Dr. Marshall also recently completed a monograph entitled “Workforce, Specialty Distribution and Capacity of Optometrists in the State of Indiana.”
The book, Borish's Clinical Refraction, edited by William "Joe" Benjamin, an updated and expanded new book with goals similar to those of Clinical Refraction by Irvin M. Borish (1970), was released this spring. This book celebrates the contributions of Dr. Irvin M. Borish. Dr. Borish, as well as four faculty members from IU, are among the contributing authors. The four IU authors are: David A. Goss, OD, PhD; Douglas H. Horner, OD, PhD; Gerald E. Lowther, OD, PhD; and P. Sarita Soni, OD, MS.

The Class of 2001 started classes last fall at IU School of Optometry. There were 77 students selected from a pool of 505. There are 36 students from Indiana, and 41 nonresidents from 18 other states and Canada. There are 38 men and 39 women. The cumulative undergraduate mean GPA was 3.45. Seventy-seven percent of the first year class have bachelor's degrees.

For IU Optometry Alumni: The IU Optometry library will provide literature searches or other requests for information to the IU alumni. Alumni can contact the library electronically at: freeman@indiana.edu or libopt@indiana.edu. They may also contact the library by phone at 812-855-8629.

General information about the Indiana University School of Optometry may be obtained via the website at www.opt.indiana.edu.