SPECIAL COMMEMORATIVE EDITION

REVIEW® OF OPTOMETRY

July 15, 2016

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125TH ANNIVERSARY ISSUE

Celebrating the origins and evolution of optometry as documented in these pages and lived in your practice.

We call it our fundamental business truth:
Your success is essential to Our success. When your practice grows and flourishes, so does ours.

At Johnson & Johnson Vision Care, we have operated according to this simple, but profound, principle for over 30 years. And it is the inspiration and energy behind every year of our 3 decades of Global leadership in the contact lens marketplace.

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3	20/70
4	20/50
5	20/40
6	20/30

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OPTOMETRY'S LIFELONG FRIEND

This magazine was created 125 years ago to be "a fountainhead of reliable information," and has held itself to that standard ever since.

BY THE EDITORS OF REVIEW OF OPTOMETRY

From its inception in 1891 as *The Optician*, the publication we now call *Review of Optometry* has been and will continue to be an informative friend to optometrists, an advocate for the advancement of the profession and a mentor providing practical and useful knowledge.

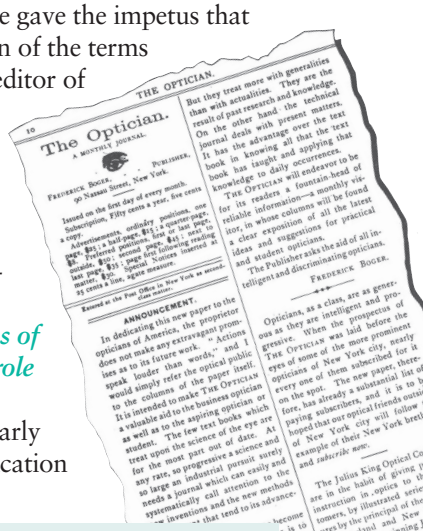
In marking this 125th anniversary, we are not taking the opportunity to pat ourselves on the back. Rather, this retrospective gives us—and hopefully, you—an opportunity to recollect the many accomplishments and successes that the profession has made in the past century and a quarter, which have been reflected and even presaged in the pages of this publication.

• ***Your Friend.*** "We like to feel that the *Journal* [*The Optical Journal and Review of Optometry*] enters the offices and home of its thousands of readers throughout the world as a friend, carrying the latest tidings of happenings and developments in their profession and business; with helpful information, inspiring suggestions; a friend who tells them the views of their co-workers in every field of optical activity, and whose teaching and educational work extends to all parts of the world."

Those words were written in the editorial page in April 1922, and they still apply today. Every month in the mail, and every day on the Internet, *Review* arrives with timely information and insights from your colleagues in the United States and abroad.

• ***Your Advocate.*** The same 1922 editorial noted that *Review* is not just a well-informed friend, but also an advocate to encourage and further the profession:

"Our early issues show that we took an active part in starting and fostering the movement which has brought about optometry laws in every state and in other countries. The very title of the new profession, the terms optometry and optometrist, were first recorded in print in our pages, and this magazine gave the impetus that resulted in the general adoption of the terms by the profession," wrote the editor of that 1922 edition. "These are illustrations of the part that the magazine has taken, not only in recording what takes place, but in doing its part for the advancement of the profession and industry." *For those looking for more on the origins of the word optometry, and our role in it, see page 62 of this issue.*


THE OPTICIAN.

The Optician.

A MONTHLY JOURNAL.

ANNOUNCEMENT.

• ***Your Mentor.*** In the very early days of optometry, clinical education

A VERY DEAD-ICATED READER

"I have been reading the old *Optical Review*, then later the *Optical Journal and Review of Optometry* for the past 36 years and look forward to its regular visits. It has not only made me a better practitioner, but its high ideals have made me a better man, and I hope to continue reading until I pass over the Great Divide."—***letter from Dr. E.H. Murray, of Pulaski, Tenn., published in the December 1, 1934 issue.***

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was nearly nonexistent. There were no CE providers, no demonstration videos on YouTube, no social media platforms to trade clinical tips and professional advice—there weren't even any optometry schools.

Founding editor Frederick Boger aimed to change all that by delivering the latest "how-to" information that went beyond dry, abstract textbooks. "The textbooks are excellent enough in their way," Mr. Boger stated in the very first issue in 1891. "But they treat more with generalities than with actualities."

A "technical journal" like *Review of Optometry* "has the advantage over the textbook in knowing all that the textbook has taught and applying that knowledge to daily occurrences," he wrote. From that first issue and in every issue since, *Review* has striven to provide up-to-date, nuts-and-bolts information that you can use right away to treat your patients and improve your practice.

What follows are just a few selections that illustrate *Review*'s long-standing history of reporting important issues in optometry and providing practical clinical information. It is with "pardonable pride" (as Frederick Boger put it) that we revisit some of these excerpts.

GUIDEPOST TO PRIMARY CARE

Has it been only recently that optometrists learned to treat not just the eye but the whole patient? Not even close. As optometry progressively advanced from an optical occupation toward a primary care profession, *Review* has been at the forefront—starting as long as a century ago. In an effort to provide education beyond the eye, articles explained systemic infectious disease, cardiovascular disease, neurological disorders and countless other subjects that regarded the patient as much more than the next eyeglass customer.

In 1957, for example, well before the current diabetes epidemic, the magazine published a comprehensive overview of the examination of patients with diabetes mellitus. Tellingly subtitled "An Optometric Responsibility," the article covered all ocular manifestations of diabetes known at that time, as well as systemic signs and symptoms and when to refer.

"It is most important to remember that the level of blood sugar at any given point in time is not directly related to the occurrence of eye lesions," wrote author Gilbert Goldenberg, OD, of Paterson, NJ. "Rather, the length of time that the blood sugar has been elevated is the important factor."

Such advice may seem elementary now, but it was likely eye-opening to optometrists in the mid-20th century.

'PIONEER' WOMEN IN OPTOMETRY

For a long, long time, optometry has been a man's profession. But, back in 1940—when only 3.6% of all registered optometrists were women—*Review* helped raise the banner to encourage the participation of women in optometry.


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"Chicago, with a population of more than 3,000,000 people, has only 35 women optometrists; New York City with over 6,000,000 has only 20," wrote optometrist Arene T. Wray, of Los Angeles, in her 1940 article about the formation of an optometric women's society.

"The type of women who could be attracted to Optometry, if it were presented to them, would most likely be a credit and benefit to the profession," Dr. Wray predicted. "They would be college women, interested in science and scientific work rather than the arts, and of a caliber that could meet and surmount all the difficulties that beset pioneers in any field."

Just two years later, *Review* editor Maurice E. Cox wrote in the October 1942 issue that "the drain of war on male youth […] will make it essential that definite appeal to women students be made at once."

But women were not mere stand-ins in the exam lane while men fought in World War II, Mr. Cox noted. "Though their number is limited, the women of optometry have made bright names for themselves […] They have been outstanding in their own right, as practitioners, in the educational field, and in organizational affairs," he wrote.

Three-quarters of a century later—as women are set to outnumber men in the profession—Mr. Cox's prescient words are more true than ever. *For more on the rise of women in optometry, see page 92.*

CONTACT LENSES COME OF AGE

It's 1937, in the midst of the Great Depression—could there be a worse time to convince patients to take off their safe, affordable spectacles and stick expensive ground glass lenses on their eyes?

"Contact lenses, when accurately fitted and made according to prescription, can in many cases be worn for hours at a time without discomfort," wrote Davis Bronson, MS, of Brooklyn, NY, in that year's "An Introduction to Contact Lenses"—the first of innumerable articles on contacts to appear in *Review*.

Very likely unaware of the impending and enormous contact lens industry, Mr. Bronson concluded with something of an understatement: "There is a large number of patients to whom contact lenses offer ideal corrective aid."

Then again, considering the long and bumpy road that clinicians faced in introducing and prescribing contact lenses to patients, Mr. Bronson's statement was more than optimistic. Even among optometrists in those days, many believed that contact lenses would never amount to anything more than a specialty item.

"So far we have had too little experience with them to warrant any rash prophecy," wrote Otto Haussmann, secretary of the Philadelphia Society of Optometrists, in a 1941 letter to the editor. "In high myopic cases, and more especially in cases of conical cornea, contact lenses undoubtedly have their advantages, but we need not fear that because of their use we will experience any marked decline in the demand for spectacles."

DOLLARS AND SENSE

Like it or not, money has always been something of a driver in optometry's journey. The first attempt to pass an optometry licensure law was a result, in part, of Charles Prentice charging a fee for an eye exam.[1] Again in 1919, optometrist Fred Baker, in cahoots with the AOA, chose to be arrested for charging for an exam in order to force Texas to pass the much-needed licensure law.[2]

While optometrists fought for the right to charge for their expertise, other revenue sources continued to muddy the waters, namely product sales. A 1939 *Optical Journal and Review of Optometry* contributor argued for charging a single fee for both the service and the product, while another argued for separate fees, suggesting that, "as long as Optometry is practiced in jewelry and department stores, [...] the public will consider it a merchandise proposition."[3,4]

Optometry saw a huge shift when it won parity with ophthalmology in the Medicare program in October 1986.[5] A few months later, the March 1987 cover story "Are You Ready for Medicare?" advises: "We have to get in the habit of billing for diagnosis and management. We must adopt the idea that our job is to diagnose and manage patients."[6] Not all that different from the days of the first legal battles, how and for what optometrist got paid helped define the practice.

While optometry's inclusion in the Medicare program was a huge battle won, the profession continues to struggle with money matters. Online glasses and contact lens suppliers are reminding the optometrists of 2016 about the need to secure a revenue base that draws on their decisions, not their dispensaries.

It seems history is doomed to repeat itself; luckily optometrists refuse to let money get in the way of what is essential to their practice: patient care.

1. Goss DA. Landmarks in the History of Optometry. Hindsight: Journal of Optometry History. 2007;38(2):47-52.
2. Bennet I. Optometrist Jailed for Charging an Exam Fee. Hindsight: Journal of Optometry History. 2010 Oct;41(4):106-8
3. Prismus. Points of the service fee—eyeglass cost problem. Optical Journal-Review. 1939;76(2):24-5.
4. Old Timer. The service fee—correction cost problem. Optical Journal-Review. 1939;76(8):23.
5. Medicare: Parity at Last. Review of Optometry. 123(11):5.
6. Margaretten M. Are You Ready for Medicare. Review of Optometry. 124(3):37-38.


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Hindsight, of course, is 20/20. *Optometry's critical role in contact lens development is profiled on page 44.*

OPHTHALMOLOGISTS 'PLAY BALL'

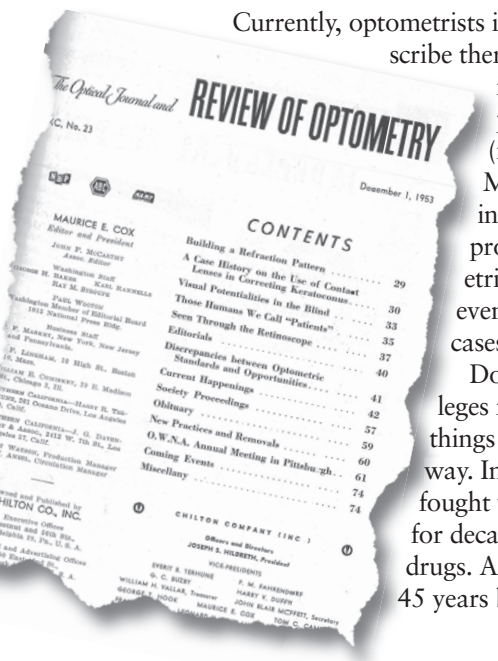
For most of the history of the profession, optometrists have (and still do) weigh themselves largely in relation to ophthalmologists. In many ways, both good and bad, optometry's identity has often been entwined with—and defined in comparison to—ophthalmology. And this complicated relationship has played out on the pages of *Review* since the beginning.

In 1934, only a dozen or so years after optometry practice laws were passed in all states, then-editor Frederick McGill predicted ophthalmology would soon come to recognize optometry as an independent profession:

"Narrow and selfish-minded individuals, largely because of the spirit of loyalty among medical men, have thus far been able to keep the old quarrel alive, but this will end in time," Mr. McGill wrote. "Organized medicine will then 'play ball' with optometry, to the benefit of both professions and to the corresponding benefit of the public, in the better services that will be developed by such cooperation."

Although it likely took much longer than he expected, Mr. McGill's prediction eventually came to pass—at least for the most part. *Early comanagement booster Paul Ajamian, OD, contemplates the current state of the relationship on page 102.*

THE DRUG PROBLEM


The Optical Journal and REVIEW OF OPTOMETRY
December 1, 1953
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Currently, optometrists in every state can prescribe therapeutic drugs. ODs in nearly all states can prescribe oral drugs (including narcotics). Many can perform injections and minor procedures, and optometrists in three states can even use lasers in some cases.

Don't take these privileges for granted, because things weren't always this way. In fact, optometrists fought within their ranks for decades against the use of drugs. As long ago as 1931—45 years before West Virginia became the first state to pass a therapeutic drug law—letters to the editor denounced "restless and unhappy" optometrists who suggested expanding the profession into medical care.

Even as late as the 1960s and 1970s, many optometrists opposed expanding optometry's scope of practice to include therapeutics and primary care.

"Younger optometrists who are unfamiliar with the history of the profession seem unaware that Ohio's medical board actually did license some optometrists as medical ancillaries in the earlier part of this century," wrote S. Drucker, OD, in a 1960 commentary article. "A historic lawsuit in Pennsylvania [in 1914] opposing this move by ophthalmologists was won only because optometrists could prove their methods were drugless and, therefore, not directly related to medical practice."

Dr. Drucker concluded, "Optometry colleges should indoctrinate students to take pride in the drugless nature of the profession and to stop looking longingly at a profession whose triumphs, though glittering, are often ephemeral."

In a similar 1971 opinion piece, optometrist George T. Warren stated: "I still stick to the classic dictum that a 'lens is not a pill' and that optometry should not slither into the family of those using nostrums and knives […] To attempt to change State laws and acquire medical powers, even the most limited, would certainly stir up a hornet's nest."

Dr. Warren was certainly right about stirring up the hornet's nest. Nevertheless, the "restless and unhappy" optometrists persevered and the first therapeutic drug law finally passed in 1976.

Review reported the response of John David Janney, OD, then-president of the West Virginia Optometric Association: "This legislation is not intended to make us into ophthalmologists. We know our limitations. We do not equate our training with that of an ophthalmologist. Our primary concern is the delivery of the finest care we can provide, consistent with our training." *The long, stormy history of scope of practice battles is detailed beginning on page 68.*

For the past 125 years, *Review of Optometry* has stood at your side as your friend, your advocate and your mentor to help you provide your finest care. It is the most widely circulated and most read optometric publication, as it has been for as long as such statistics have been measured. Optometry has come very far from its humble roots, and *Review* will be there as the profession advances into the future. ■

Down, Boy.

Help Tame Postoperative Ocular Inflammation and Pain With LOTEMAX® GEL

Indication

LOTEMAX® GEL (loteprednol etabonate ophthalmic gel) 0.5% is indicated for the treatment of post-operative inflammation and pain following ocular surgery.

Important Safety Information about LOTEMAX® GEL

- LOTEMAX® GEL is contraindicated in most viral diseases of the cornea and conjunctiva including epithelial herpes simplex keratitis (dendritic keratitis), vaccinia, and varicella, and also in mycobacterial infection of the eye and fungal diseases of ocular structures.
- Prolonged use of corticosteroids may result in glaucoma with damage to the optic nerve, defects in visual acuity and fields of vision. If this product is used for 10 days or longer, IOP should be monitored.
- Use of corticosteroids may result in posterior subcapsular cataract formation.
- Use of steroids after cataract surgery may delay healing and increase the incidence of bleb formation and occurrence of perforations in those with diseases causing corneal and scleral thinning. The initial prescription and renewal of the medication order should be made by a physician only after examination of the patient with the aid of magnification, and where appropriate, fluorescein staining.
- Prolonged use of corticosteroids may suppress the host response and thus increase the hazard of secondary ocular infection. In acute purulent conditions, steroids may mask infection or enhance existing infection.
- Use of a corticosteroid medication in the treatment of patients with a history of herpes simplex requires great caution. Use of ocular steroids may prolong the course and exacerbate the severity of many viral infections of the eye (including herpes simplex).
- Fungal infections of the cornea are particularly prone to develop coincidentally with long-term local steroid application. Fungus invasion must be considered in any persistent corneal ulceration where a steroid has been used or is in use.
- Patients should not wear contact lenses when using LOTEMAX® GEL.
- The most common ocular adverse drug reactions reported were anterior chamber inflammation (5%), eye pain (2%) and foreign body sensation (2%).

Please see brief summary of Prescribing Information on adjacent page.

LOTEMAX® GEL
loteprednol etabonate
ophthalmic gel 0.5%

BAUSCH + LOMB

BRIEF SUMMARY OF PRESCRIBING INFORMATION

This Brief Summary does not include all the information needed to prescribe Lotemax Gel safely and effectively. See full prescribing information for Lotemax Gel.

Lotemax (loteprednol etabonate ophthalmic gel) 0.5%

Rx only
Initial Rx Approval: 1998

INDICATIONS AND USAGE

LOTEMAX is a corticosteroid indicated for the treatment of post-operative inflammation and pain following ocular surgery.

DOSAGE AND ADMINISTRATION

Invert closed bottle and shake once to fill tip before instilling drops.

Apply one to two drops of LOTEMAX into the conjunctival sac of the affected eye four times daily beginning the day after surgery and continuing throughout the first 2 weeks of the post-operative period.

CONTRAINDICATIONS

LOTEMAX, as with other ophthalmic corticosteroids, is contraindicated in most viral diseases of the cornea and conjunctiva including epithelial herpes simplex keratitis (dendritic keratitis), vaccinia, and varicella, and also in mycobacterial infection of the eye and fungal diseases of ocular structures.

WARNINGS AND PRECAUTIONS

Intraocular Pressure (IOP) Increase

Prolonged use of corticosteroids may result in glaucoma with damage to the optic nerve, defects in visual acuity and fields of vision. Steroids should be used with caution in the presence of glaucoma. If this product is used for 10 days or longer, intraocular pressure should be monitored.

Cataracts

Use of corticosteroids may result in posterior subcapsular cataract formation.

Delayed Healing

The use of steroids after cataract surgery may delay healing and increase the incidence of bleb formation. In those diseases causing thinning of the cornea or sclera, perforations have been known to occur with the use of topical steroids. The initial prescription and renewal of the medication order should be made by a physician only after examination of the patient with the aid of magnification such as slit lamp biomicroscopy and, where appropriate, fluorescein staining.

Bacterial Infections

Prolonged use of corticosteroids may suppress the host response and thus increase the hazard of secondary ocular infections. In acute purulent conditions of the eye, steroids may mask infection or enhance existing infection.

Viral Infections

Employment of a corticosteroid medication in the treatment of patients with a history of herpes simplex requires great caution. Use of ocular steroids may prolong the course and may exacerbate the severity of many viral infections of the eye (including herpes simplex).

Fungal Infections

Fungal infections of the cornea are particularly prone to develop coincidentally with long-term local steroid application. Fungus invasion must be considered in any persistent corneal ulceration where a steroid has been used or is in use. Fungal cultures should be taken when appropriate.

Contact Lens Wear

Patients should not wear contact lenses during their course of therapy with LOTEMAX.

ADVERSE REACTIONS

Adverse reactions associated with ophthalmic steroids include elevated intraocular pressure, which may be associated with infrequent optic nerve damage, visual acuity and field defects, posterior subcapsular cataract formation, delayed wound healing and secondary ocular infection from pathogens including herpes simplex, and perforation of the globe where there is thinning of the cornea or sclera.

The most common adverse drug reactions reported were anterior chamber inflammation (5%), eye pain (2%), and foreign body sensation (2%).

USE IN SPECIFIC POPULATIONS

Pregnancy

Teratogenic Effects: Pregnancy Category C.

Loteprednol etabonate has been shown to be embryotoxic (delayed ossification) and teratogenic (increased incidence of meningocele, abnormal left common carotid artery, and limb flexures) when administered orally to rabbits during organogenesis at a dose of 3 mg/kg/day (35 times the maximum daily clinical dose), a dose which caused no maternal toxicity. The no-observed-effect-level (NOEL) for these effects was 0.5 mg/kg/day (6 times the maximum daily clinical dose). Oral treatment of rats during organogenesis resulted in teratogenicity (absent innominate artery at ≥5 mg/kg/day doses, and cleft palate and umbilical hernia at ≥50 mg/kg/day) and embryotoxicity (increased post-implantation losses at 100 mg/kg/day and decreased fetal body weight and skeletal ossification with ≥50 mg/kg/day). Treatment of rats with 0.5 mg/kg/day (6 times the maximum clinical dose) during organogenesis did not result in any reproductive toxicity. Loteprednol etabonate was maternally toxic (significantly reduced body weight gain during treatment) when administered to pregnant rats during organogenesis at doses of ≥5 mg/kg/day.

Oral exposure of female rats to 50 mg/kg/day of loteprednol etabonate from the start of the fetal period through the end of lactation, a maternally toxic treatment regimen (significantly decreased body weight gain), gave rise to decreased growth and survival, and retarded development in the offspring during lactation; the NOEL for these effects was 5 mg/kg/day. Loteprednol etabonate had no effect on the duration of gestation or parturition when administered orally to pregnant rats at doses up to 50 mg/kg/day during the fetal period.

There are no adequate and well controlled studies in pregnant women. LOTEMAX should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Nursing Mothers

It is not known whether topical ophthalmic administration of corticosteroids could result in sufficient systemic absorption to produce detectable quantities in human milk. Systemic steroids appear in human milk and could suppress growth, interfere with endogenous corticosteroid production, or cause other untoward effects. Caution should be exercised when LOTEMAX is administered to a nursing woman.

Pediatric Use

Safety and effectiveness in pediatric patients have not been established.

Geriatric Use

No overall differences in safety and effectiveness have been observed between elderly and younger patients.

NONCLINICAL TOXICOLOGY

Carcinogenesis, Mutagenesis, Impairment Of Fertility

Long-term animal studies have not been conducted to evaluate the carcinogenic potential of loteprednol etabonate. Loteprednol etabonate was not genotoxic *in vitro* in the Ames test, the mouse lymphoma tk assay, or in a chromosome aberration test in human lymphocytes, or *in vivo* in the single dose mouse micronucleus assay. Treatment of male and female rats with up to 50 mg/kg/day and 25 mg/kg/day of loteprednol etabonate, respectively, (600 and 300 times the maximum clinical dose, respectively) prior to and during mating did not impair fertility in either gender.

PATIENT COUNSELING INFORMATION

Administration

Invert closed bottle and shake once to fill tip before instilling drops.

Risk of Contamination

Patients should be advised not to allow the dropper tip to touch any surface, as this may contaminate the gel.

Contact Lens Wear

Patients should be advised not to wear contact lenses when using LOTEMAX.

Risk of Secondary Infection

If pain develops, redness, itching or inflammation becomes aggravated, the patient should be advised to consult a physician.

Bausch & Lomb Incorporated
Tampa, Florida 33637 USA

US Patent No. 5,800,807

US/LGX/15/0042
Based on 9269100-9269200 Revised: 9/2012

REVIEW OF OPTOMETRY®
125 YEARS
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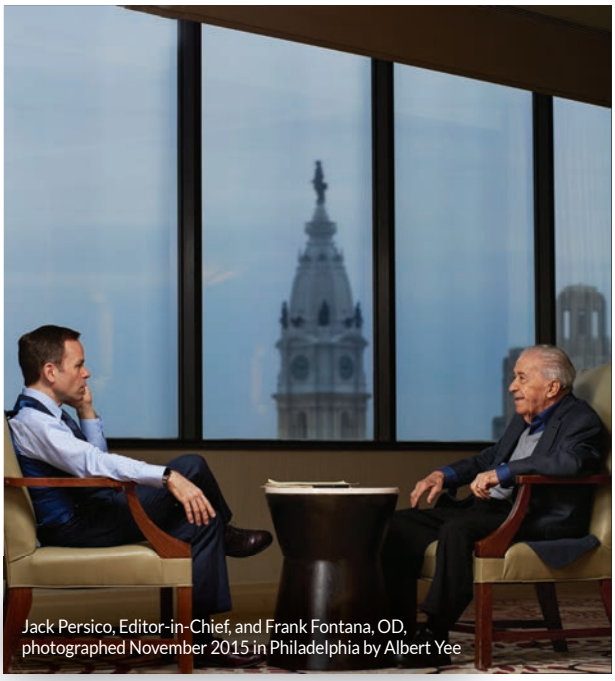
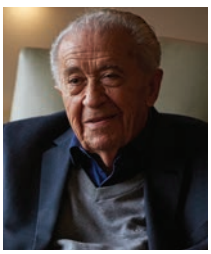

Jack Persico, Editor-in-Chief, and Frank Fontana, OD, photographed November 2015 in Philadelphia by Albert Yee

PART 4: REFLECTIONS



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BY MONTGOMERY VICKERS, OD

Looking deeper
Exploring innovation

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125 YEARS

PART 1 BEGINNINGS

AN ORIGIN STORY

Optometry's gains were hard won. An awareness of the past will help you create a vision of the future.

BY JACK PERSICO, EDITOR-IN-CHIEF

Optometrists in 2016 have abundant opportunity: to practice full-scope primary eye care, to learn new skills and connect with others at professional meetings, and to have their voices heard in the corridors of power. In short, to succeed.

None of those happened by chance. And none came easily. The profession you practice today is very much the product of the courageous, talented people who made it what it is—optometry's path through history was not inevitable. It didn't develop from the traditional medical institutions, so it didn't have the advantage of their resources and respectability. Quite the contrary, of course: the medical establishment opposed it vigorously. Had it not been for leaders with passion and tenacity, optometry might never have evolved much beyond optics and refraction.

Indulge in a little alternate history speculation and you'll see:

Remove Albert Fitch from the story and huge chunks of your optometric education go poof.

Remove Charles Lembke and optometry loses cohesion and national identity.

Remove Norman Haffner and your scope of practice shrinks.

Remove Brien Holden and contact lenses get more painful for everyone.

Remove Irv Borish and just try to get a decent manifest refraction.

Remove Charles Prentice and it all collapses like a house of cards.

Dozens more names belong on such a list, needless to say.

We at *Review of Optometry* think it's fair to say that if you remove Frederick Boger, you would see a ripple effect across all of the above—because this magazine wouldn't have been chronicling and advocating and educating for the last 125 years. Boger was also a tireless proponent of a national organization and worked hard to found what is now the American Optometric Association.

So, on our 125th anniversary we are breaking from our usual format for a deep dive into the past. Why? Because it's a fascinating story, rich with drama. And because the future depends on it. Knowing the past shows us what's possible.

This special issue is organized into four parts:

1. Beginnings offers perspective on the arc of history.

2. Then and Now looks at our early coverage of key clinical topics through the lens of 2016.

3. Events That Made Optometry recounts tumultuous transitions that altered the DNA of the profession.

4. Reflections shares the opinions and memories of old friends and long-time contributors to *Review*.

We hope you enjoy the chance to learn more about the people and events that shaped your world—and then maybe to reshape it yourself. ■

FITTING WITH CONFIDENCE

How osmolarity testing can help guide contact lens selection and make patients feel good about choosing healthier options—even when they cost more. **By David Geffen, OD and Paul Karpecki, OD**

While switching materials and solutions can't solve every patient's contact lens woes, making a change is not without virtue in many cases. The key to success lies in making educated decisions that can be measured versus following the well-tread trial-and-error path.

Part of the reason why 16% of contact lens wearers drop out every year[1,2] is because patients and doctors hesitate to move into a more appropriate lens. More often than not, such wavering is driven primarily by fear of the increased expense with little regard to the long-term consequences of discomfort.

Similarly, it's equally precarious to switch patients into new lenses if we're not quite sure whether the new lenses can offer any meaningful improvement. TearLab osmolarity testing can directly address these challenges by providing an objective measure that offers peace of mind to both patient and doctor alike.

BE DIRECT

If you ask a patient how he's doing with his contact lenses, he will likely say he's doing "fine"—even if he's taking his lenses out as soon as he gets home from work. Patients are afraid that you will either tell them they can't wear their lenses anymore or you will try to prescribe a more expensive lens. To combat this, it's important to ask specific targeted questions such as, "Do you feel like you need to take your lenses out when you get home from work?" Any patient who says "yes" is a dropout waiting to happen. Or ask how the comfort compares when first inserting the lenses to when removing them at the end of the day on a 1 to 10 scale. What's more, these patients don't merely drop out of lenses, they tend to drop out of the practice as well. Missed annual exams are a common byproduct of contact lens dropout with consequences that can far outweigh a conversation about pricier contacts.

STAY ONE STEP AHEAD

Dry eye affects nearly 30 million Americans—including 50% of all contact lens wearers.[3-7] Therefore, even if a patient is asymptomatic, we must be diligent about addressing the ocular surface before it's too late. Indeed, research suggests that relying on symptoms to diagnose dry eye would produce a missed or incorrect diagnosis more than 40% of the time.[8-10] Without the use of measurable clinical indicators, these patients are at risk of one day dropping out of contact lenses.

For this reason, anytime a contact lens patient shows a sign or symptom of dry eyes, we test their osmlar-

CASE #1

A 36 year-old female presents wearing Acuvue 2 monthly replacement (OD -2.75, OS -3.00). The patient reports that her eyes are irritated and she needs to take out her contact lenses when she gets home from work. She also reports that her wearing time has diminished and comfort has decreased. Slit-lamp exam reveals clear corneas and grade 1 GPC OU, with all other findings normal. Osmolarity scores are 308 OD and 311 OS. We recommended switching to a daily replacement lens, but the patient was wary of the increased cost. The patient agreed to try Dailies Total One for one week to see how her eyes would feel.

At the one-week visit, the patient commented on how much better her eyes feel, adding that she now has to remember to take the contacts out before going to bed. Slit-lamp exam showed minor GPC with no injection. Osmolarity scores were lowered to 299 OD and 300 OS. Convinced, the patient is currently wearing the new lenses.

CASE #2

A 33 year-old male reports that his contact don't feel as comfortable as they used to. He has been wearing Frequency 55 (-5.00 OD, -4.50 OS) for the past seven years and reports that he replaces them about every month. He uses Kirkland disinfectant. Slit lamp reveals grade 1+ papilla OU and minor injection OU. Osmolarity was 307 OD, and 312 OS.

We recommended that the patient switch to a daily lens to improve comfort and compliance. Though the patient was wary of cost increase, we asked him to trial Biotrue ONEday.

At the one-week visit, the patient reported great improvement in comfort and much clearer vision. He says he can now wear lenses all day and not think about them. Osmolarity dropped to 300 OD/OS. The patient purchased an annual supply of the new lenses.

ity with the existing contact lenses in place. One of the most convenient aspects of the TearLab test is that it can be performed while wearing contact lenses.

If osmolarity is out of range, we recommend that the patient trial a different lens. Explain that there is no obligation to switch. You are simply testing out the new lenses to determine whether it will make a difference. Most patients are eager to try new lenses when there is an understanding that it's just a test drive.

After the trial is over, check osmolarity again and compare the number with what you measured in the initial lens. Present this data to the patient and ask if they also feel any different. When patients are presented with hard numbers on top of the general improved comfort that they often experience, they are much more likely and willing to make good choices—regardless of cost. Indeed, an improved osmolarity score goes a long way toward justifying increased contact lens expenses and a better patient experience.

Keeping presbyopes in contact lenses can be especially challenging since this group is at particularly high risk of developing dry eye. Patients who wear multifocal lenses tend to have dryer eyes to begin with and are a lot more likely to drop out. As clinicians we tend to regard prebyopes as a group looking for simplicity and we sometimes ask ourselves "why fight it?" Yet keeping this population happy does not need to be complicated. When you check the osmolarity scores in a presbyope's current lenses and then compare them to improved scores in a different lens, these patients readily recognize the healthier advantages. Switching alone without producing an osmolarity score, on the other hand, is more challenging. We have found that some of the newer technology lenses help significantly regarding osmolarity improvement of the tear film.

EVIDENCE DEMONSTRATES VALUE

Osmolarity testing allows you to justify your clinical decision-making in a way that patients can easily understand. When this quick test shows that osmolarity is high, it opens the door to a conversation about why trying something new is in the patient's best interest.

TearLab osmolarity testing is one of the few tests we have to confirm dry eye, and it's the most predictive test for dry eye. It provides scientific, objective proof and reasoning for our recommendations. It's also the fastest test for dry eye, requiring fewer than 30 seconds from test to result.

As we discussed in part one of this series, the most effective way to combat dropout is to identify patients who are at risk before they start to complain (*see A Game-Changing Approach to Help Overcome Contact Lens Dropout, May issue, page 30*). Once a patient is complaining, it's often too late. We need to identify which patients are at risk of dropping out prior to first fittings and at each exam thereafter. The TearLab test makes this easy to accomplish. And, in the event you need to ask a patient to spend more money, you can be sure that the patient can see real value in the objective evidence that you present.

1. Nichols JJ. 2010 annual report on dry eye diseases. CL Spectrum. 2010;15(8):22.
2. Key JE. Development of contact lenses and their worldwide use. Eye Contact Lens. 2007;33(6 Pt 2):343-5.
3. National Eye Institute. Facts about dry eye. Available at: https://nei.nih.gov/health/dryeye/dryeye (last accessed June 13 2016).
4. Begley CG, Caffrey B, Nichols KK, et al. Responses of contact lens wearers to a dry eye survey. Optom Vis Sci. 2000;77(1):40-6.
5. Schaumberg DA, Sullivan DA, Buring JE, et al. Prevalence of dry eye syndrome among US women. Am J Ophthalmol. 2003;136(2):318-26.
6. Paulsen AJ, Cruickshanks KJ, Fischer ME, et al. Dry eye in the beaver dam offspring study: prevalence, risk factors, and health-related quality of life. Am J Ophthalmol. 2014;157(4):799-806.
7. US Census Bureau. Age and sex composition: 2010. http://www.census.gov/prod/cen2010/briefs/c2010br-03.pdf (last accessed June 13, 2016).
8. Bron AJ, Tomlinson A, Foulks GN, et al. Rethinking dry eye disease: a perspective on clinical implications. Ocul Surf. 2014 Apr 12(2 Suppl):S1-31.
9. Sullivan BD, Crews LA, Messmer EM, et al. Correlations between commonly used objective signs and symptoms for the diagnosis of dry eye disease: clinical implications. Acta Ophthalmol. 2014 Mar;92(2):161-6.
10. Fuerst N, Langelier N, Massaro-Giordano M. Tear osmolarity and dry eye symptoms in diabetics. Clin Ophthalmol. 2014 Mar;8:507-15.

CASE #3

A 59 year-old female presented wearing PureVision2 multifocal (+1.00 high OD, +1.25 high OS). She reported that comfort has consistently decreased with her contacts over past five years and her vision has become more variable. She is thinking of giving up contacts for glasses, concluding that her lenses are "not worth the hassle." Slit-lamp exam reveals G1 MGD, dry eyes, and grade 1 injection OU. Osmolarity is 319 OD and 320 OS.

We educated the patient about new innovative technology in the ULTRA for Presbyopia lens material and described how this would be better for her. We also ask her to use artificial tears, start Omega fatty acids, and use a Bruder mask for 10 minutes a day.

At the one-week visit, the patient feels much better in her contacts. She reports that her eyes feel much less dry, and her vision is not variable throughout day. Her osmolarity also dropped to 307 OD/OS. Considering the great overall improvement, she proceeds with the ULTRA for Presbyopia lenses.

125 YEARS OF OPTOMETRY

1891 1900 1910 1920 1930 1940 1950

January 1891—*The Optician* launched by Frederick Boger, with a mandate to "be for its readers a fountain-head of reliable information—a monthly visitor, in whose columns will be found a clear exposition of all the latest ideas and suggestions." First issue includes a feature from Charles Prentice, "the father of optometry."

February 1891—Boger writes an editorial on the need for a national association of opticians.

April 1891—Carnegie Hall opens in New York.

December 1891—*The Optician* completes its first year by announcing it has 850 subscribers.

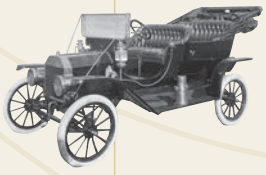
1895—Charles Prentice charges a fee for an eye exam, enraging a group of NY ophthalmologists who threaten to have him arrested.

March 1895—Name changed to *The Optical Journal*. Debut issue in this form includes an article using the word "optometry" to describe the science of refraction.

1898—American Association of Opticians (precursor to the American Optometric Association) is formed.

1895—Guglielmo Marconi invents the wireless telegraph.

1900—Bayer launches aspirin in water-soluble pill form, the first medication to use this delivery vehicle.



October 1, 1908—Ford's Model T hits the roads.

1901—First licensure law passed in Minnesota.

1902—A periodical named *The Focus*, started in 1900 or 1901, merges with *The Optical Journal*.

December 17, 1903—The Wright brothers pilot the first airplane at Kitty Hawk, NC.

March 1904—*The Optical Journal* changes from a monthly to a weekly publication.

1906—*The Optical Instrument Monthly*, begins operation. It was soon taken over by *The Optical Journal*.

1907—*The Jeweler's Circular-Weekly*, which had started devoting space to optical matters in the early 1880s, launches a publication named *The Optical Review*.

March 2, 1909—Henry Bausch passes away. (Obituary published in *The Optical Review*.)

1910—*The Optical Journal* merges with *The Optical Review* to form *The Optical Journal and Review of Optometry*. It would operate under that name for the next 67 years.

1910—Columbia University School of Optometry enrolls its first students. It would be shut down in 1954 in the face of opposition from ophthalmology.

1911—*Dynamic Skiametry in Theory and Practice* by Andrew Cross, an early retinoscopy text, is published.

1911—Alva Cross serves as presiding officer over the AOA congress, the first woman in a leadership role in optometry.

May 7, 1915—128 Americans killed in a German attack on the British liner *The Lusitania*.

April 6, 1917—US declares war on Germany.

1919—International Board of Boards (IBB) established. Name changed to International Association of Boards of Examiners in Optometry (IAB) in 1954, and to the Association of Regulatory Boards (ARBO) in 1999.

1919—Texas optometrist Fred Baker arrested for charging a fee. In 1921, he won the case against him and Texas became the final state to approve an optometry licensure law.

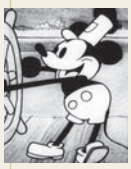
1922—First Conference on Optometric Education held in St. Louis, establishing optometric educational standards.

1922—The American Academy of Optometry begins after many false starts.

1923—Legislation adopted in PA gives Pennsylvania College of Optometry authority to award the Doctor of Optometry degree, a first in the US.

October 1, 1919—Cincinnati wallops Chicago in game 1 of the World Series, winning 9-1. After a year of rumors, Chicago star "Shoeless" Joe Jackson confirms they threw the series in exchange for payoffs from gamblers.

Nov. 18, 1928—Walt Disney debuts first animated film with synchronized sound, *Steamboat Willie*, introducing the world to Mickey and Minnie Mouse.



1924—Last optometric licensure law passes, in the District of Columbia, completing a 23-year effort for legal status nationwide.

1925—The AOA forms the Council on Optometric Education to accredit optometric education institutions.

1928—Bacteriologist Alexander Fleming accidentally discovers the antibacterial properties of penicillin after leaving a Petri dish of *Staphylococcus* uncovered.

1935—PA College of Optometry increases graduation requirement to four years of coursework, up from three.

1937—*Reader's Digest* publishes "Optometry on Trial," a scathing critique of the profession.

1937—Bill in PA legislature to permit optometrists to use drugs for diagnosis and treatment and perform limited eye surgery fails by one vote.

1938—*Neill vs. Gimbel* case decides that optometry is not part of medicine.

May 15, 1943—AOA President Ewing Adams, OD, writes in *The OJRO* in support of the ODs joining the war effort. "In time of war, optometry has a special skill which is needed by the armed forces and industrial workers."

1947
Congress creates the Optometry Corps, allowing for the commission of optometrists in the military. ODs are placed on the staff of VA hospitals.

1947
Optometrist Robert Graham develops ophthalmic lenses made from CR-39, a moldable plastic, allowing the move from glass lenses to shatterproof plastic for better safety and greater variety in shape.

1948
Irvin Borish publishes *Clinical Refraction*, a landmark text used by optometry students for decades.

1950
In the first major federal intervention to advance optometry, Congress grants ODs privileges to certify blind patients for pensions, despite fierce lobbying from ophthalmology.

1951
National Board of Examiners in Optometry founded.

1954
Leaders meet in Seattle to discuss how to combat ophthalmology's skullduggery following the closure of the Columbia University School of Optometry, and resolve to prohibit "untrained and unlicensed persons" from practicing optometry.

Dec. 7, 1941—Japan bombs Pearl Harbor.

■ Milestones in Optometry
■ *Review of Optometry* History
■ Events in the Culture

Thanks to Irving Bennett, OD, Ron Ferrucci, OD, and the AOA's Kirsten Hebert for research assistance

1891 1900 1910 1920 1930 1940 1950

1960 1970 1980 1990 2000 2010 2016

1964—Cyrus Bass files lawsuit against the American Medical Association, charging it with anti-trade violations.

1965—An act of Congress creates the Medicare program, but leaves optometry out of the bill.

May 15, 1977 *Review of Optometry*, after years of minimizing *The Optical Journal* in its logo, finally omits it altogether to emphasize the optometrist's role as a health professional.

1955—A group of Oakland optometrists form California Vision Services, the first prepaid vision plan in America. In 1976, after growing to nationwide coverage, it changes name to VSP.

1965—*Optometric Management* launched with emphasis on improving the business acumen of practicing optometrists.

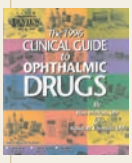
1968—American Optometric Student Association begins.

1969—National Optometric Association founded in Richmond, VA with the goal of advancing the visual health of minority populations.

1970—Optometrists employed by the City of New York for vision care form the first union of optometrists in the United States. A second union started by Kaiser-Permanente in 1971 still operates in 2016.

1984—Optometrist Jimmy Bartlett publishes *Clinical Ocular Pharmacology*, an indispensable text on the proper use of therapeutic drugs.

1986—Medicare Law amended to define optometrists as "physicians" and, therefore, allowed to be reimbursed for its services.



May 1996 —*Review* publishes the first issue of its highly popular *Clinical Guide to Ophthalmic Drugs*, an annual supplement by optometrists Ron Melton and Randall Thomas.

October 1990—The American Public Health Association passes the "Access to Treatment for Eye Care by Optometrists" resolution condoning DPA and TPA use by optometrists, accelerating the pace of legislative victories in several states.

March 1997— Debut of the annual *Handbook of Ocular Disease Management* by optometric educators Joseph Sowka, Andrew Gurwood and Alan Kabat.

1998—Oklahoma passes the first law allowing limited use of lasers by optometrists.

2005—Oklahoma regains the right to use lasers after losing it.

2011—Dori Carlson, OD, becomes the first female president of the AOA.

December 26, 1991—The Soviet Union is dissolved.

January 2000—*Review of Optometry* spins off its cornea and contact lens coverage into a standalone publication, *Review of Cornea & Contact Lenses.*

August 4, 1961—First Black US President Barack Obama born in Honolulu.

November 22, 1963—US President John F. Kennedy shot and killed in Dallas.

1971—Rhode Island passes first DPA law, securing legislative right for optometrists to use diagnostic drugs.

1971— Bausch + Lomb introduces SofLens, the first hydrogel contact lens.

1972—Volunteer Optometric Services to Humanity (VOSH) established.

1976—West Virginia signs first TPA law, giving ODs in the state the right to use therapeutic drugs as well as diagnostic ones.

1976—Congress passes a law establishing optometry services within the VA's Department of Medicine and Surgery.

1964—AOA establishes the Vision Institute of America to accommodate the nationwide contract negotiated by the Teamsters Union to provide vision care and eyeglasses to its membership.

February 9, 1964—Ed Sullivan introduces American teenagers to The Beatles.

1978—The Federal Trade Commission's "Eyeglasses I" ruling requires release of prescriptions to patients.

1978—OptiFair conference launched with emphasis on improving optometric business skills. Its success influenced the approach to optometric conventions nationally and regionally. In 1986, it became Vision Expo.

January 16, 1968—Optometry leaders hold the "La Guardia conference" in New York to debate if, and how, the profession can legislate drug privileges for expanded scope of practice (an unofficial meeting).

February 10-12, 1969—Airlie House conference of optometric leaders called by AOA to discuss if and how optometry could secure legislative privileges to use diagnostic and therapeutic drugs (an official meeting).

January 15, 1967—Green Bay Packers defeat the Kansas City Chiefs in the first Super Bowl, launching an event that continues to break television records.

1988—Optometrist Louis Catania publishes *Primary Care of the Anterior Segment*, an essential reference for examination and care of the cornea, uvea and ocular adnexa.

1989—Larry Alexander publishes *Primary Care of the Posterior Segment,* an essential reference for vitreoretinal examination and care.

1993—Joan Exford Korb, OD, becomes the first female president of the American Academy of Optometry.

2009—American Board of Optometry established with the aim of creating a board certification program to improve optometric participation in health care plans. Acrimony ensues as the idea polarizes the profession.

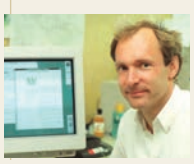
March 23, 2010— Patient Protection and Affordable Care Act signed into law. The Harken Amendment (named after its champion, Sen. Tom Harkin) made sure health plans wouldn't discriminate against optometrists.

September 4, 1998—Google is founded by Stanford PhD students Larry Page and Sergey Brin.

September 11, 2001—Nearly 3,000 people from over 90 countries killed during coordinated attacks in New York, Washington, DC, and Pennsylvania.

2016 Influential optometric educators Larry Alexander and Norman Haffner pass away.

June 23, 2016 The United Kingdom's "Brexit" vote to leave the European Union causes economic and political upheaval.



1989—English computer scientist Tim Berners-Lee invents the World Wide Web.

July 4, 2012—The Higgs boson particle is discovered, solving a fundamental problem of particle physics.

125 YEARS OF OPTOMETRY

1960 1970 1980 1990 2000 2010 2016

A WITNESS TO HISTORY

See more than 70 years of challenge and change through the eyes of an optometrist who lived through many seismic events in the profession's evolution.

BY IRVING BENNETT, OD

"Come in here, Private Bennett, and tell me what eye condition this soldier has." Those were some of the first words I heard from Major Clark, the ophthalmologist in charge of the Eye Clinic on the B-24 Air Force Base in Clovis, NM in August 1944. I had just graduated from the Pennsylvania College of Optometry, having been deferred from the World War II draft to finish my schooling. The draft board concluded I would be more valuable to the war effort examining eyes than firing a gun.

The author in his World War II days—a lowly private despite his doctor of optometry degree.

I went into the room where a young soldier was sitting in the exam chair. He surely did not realize that what was playing out before him was a snapshot of the bitter feelings between ophthalmology and optometry. No sooner had I picked up an ophthalmoscope before Major Clark went one step further, saying, "Don't ask this soldier any questions—just tell me what he has." Wow, here I am, a fresh Army recruit with no real-life professional experience, being given a test. And by an ophthalmologist, no less!

"Well," I said after having a good look at the retina, "if I could ask this soldier if he could see out of this eye and he said he could not, I would say he has an optic atrophy. And if he said he could see out of the eye, I would say he has optic neuritis."

Major Clark looked at me and grunted as he left the room, "That's right, *Private*. But less than 5% of the optometrists in this country would know that." I replied as he was leaving, "I think you are wrong, Major; 95% would know it." I am not sure if he heard me. But I was jubilant.

GROWING PAINS

That interaction occurred more than 70 years ago. Optometry of those days was absolutely nothing like what it is today. Imagine, for a moment, that I was an OD and a *private* in the Army. The Armed Forces did not recognize me as a professional! So many of my optometric colleagues in the service were like me—practicing optometry with no officer designation.

What has happened to optometry in the seven decades since my incident in Clovis is little short of miraculous. It can be compared to an infant becoming an adult—only much harder and much quicker. This 125th anniversary milestone for *Review of Optometry* has provided me the opportunity to think about many of the advances and changes that have happened to my beloved profession in my lifetime. Join me in a brief trip down memory lane. If you are a young optometrist, you may read in disbelief about the *what* and the *how it happened*. You already appreciate the *why* it happened!

• **Optometry in the 1940s was a drugless profession.** Yes, the right to use diagnostic drugs to get a better view

of the retina was illegal. And of course, the right to use therapeutic drugs to treat any of the eye diseases that we may have encountered was totally forbidden. Military optometrists who were often allowed to use both diagnostic and therapeutic drugs in the service—even as noncommissioned soldiers—now, as veterans, were annoyed and angry that this privilege was denied to them and their patients. **It took until 1971 for Rhode Island to become the first state** to grant the legal right for optometrists to use diagnostic drugs; a couple of years later, West Virginia and North Carolina took the logical next step into therapeutic privileges.

• These changes did not come easily, because optometry is a state-legislated profession. **The opposition to expand optometric privileges seemed to be everywhere.** Actually, it came both from within and without. The bitter opposition from ophthalmology was fierce and primarily done for predictable economic reasons. More troubling was the internal opposition. Our profession's leadership, including the members of the Board of Trustees of the American Optometric Association, were from the "old school" and wanted to maintain the uniqueness of optometry; that is, being no part of medicine and being a drugless profession. In fact, one of my optometric heroes, Dr. H. Ward Ewalt, Jr., when he was the secretary-treasurer of the AOA Board, told me that he personally would go before the Pennsylvania Legislature and testify against any optometric legislative efforts to get the drug use privilege.

• Some decisions that now seem so elementary were often hard to achieve. **The profession was flooded with optometrists after the war** and it was not easy for the nation to absorb the many optometric veterans looking to enter private practice. The AOA needed to remain strong not only to achieve new gains for the profession, but even more so to ward off legislation that would further restrict optometry. There was strong debate at many sessions of the AOA's House of Delegates to pass a resolution to encourage these new-to-practice optometrists to join by making the dues for membership free the first year and on a sliding scale for the next few years. A major accomplishment of a strong, unified AOA was **convincing the United States Congress to create an Optometry Corps** in the Armed Services and automatically awarding an officer ranking to ODs who joined it.

• In my early years, the **schools and colleges** were, as it is today, a mix of private schools and public universities. Then, there were fewer public colleges that offered optometry courses. And for the few that did, there was a fear in the '40s that they might follow the example of Columbia University. Columbia had a good optometry school for years but—probably because of pressure from ophthalmology—gave up the offering. Fortunately, the other schools did not go along. Instead, one at a time, both the private and public schools followed the good example of the Pennsylvania College of Optometry and (1) **began to extend optometric education** to four years; (2) began to require at least two or three years of liberal arts education before matriculating into optometry; and (3) began awarding a Doctorate of Optometry degree.

• **The increased years of education made a world of**

HISTORY MATTERS!

In 1968, the Philip Morris Company advanced the slogan "You've come a long way, baby!" to introduce Virginia Slims, its new brand of cigarettes targeted to women. They were hoping to capitalize on the passion and progress of the emerging feminist movement.

Optometry could well co-opt that slogan in celebrating its own progress during that same time period. The current generation of students and new graduates will enjoy a wider range of clinical privileges than any other generation of optometrists.

As today's young ODs hit the ground running, I urge them to appreciate that this enormous advantage was not a birthright—it's due to the hard work and sacrifice of many who knew our profession could become better, and worked collaboratively with the AOA, its state affiliates, ASCO, ARBO and other groups to make that vision come true.

And the key to making optometry's future even better is to learn from the lessons found in its gritty, hardscrabble history.

But these insights need not be limited to the young. ODs of every generation can better understand their own challenges by knowing how their forebears responded to adversity.

The Optometric Historical Society (OHS) was established in 1969 to, among other things, "assist in securing and documenting the recollections of those who have participated in the development of optometry."

Hindsight, the official publication of the OHS, appears quarterly to retell the major stories of optometry's incredible history, and relate many of the otherwise lost "little stories" or the "back stories" behind some of the seminal events in our history.

I invite all optometrists to take pride in our profession's history, to learn from it, and then use it to help optometry continue its advancement. Please visit www.aoafoundation.org/ohs and join the OHS today.

Each one of us should take our cue from Winston Churchill, who once said, "History will be kind to me, for I intend to write it."

Know our collective history, then write your own. Start with your membership in the OHS.

—Ron Ferrucci, OD, President, Optometric Historical Society

difference as the battle for drug privileges went nationwide in the 1970s. It is hard for me to reveal that my total patient contact (outside my fellow students) in the college clinic in 1944 was 17 individuals. Yes, I had exposure to only 17 patients in my entire college clinical training. The movement to get drug privileges had to be supported by students having more real-life patient contact. This caused the colleges to create externships in busy optometry practices, with some friendly ophthalmologists and in a few hospitals and clinics. The big coup was the development of an externship program with the Veterans Administration. Now it is commonplace for graduating students to examine and treat more than 1,000 patients in their training.

• **The poor relationship with ophthalmology** seemed to me to be never ending. The dislike, particularly at the organizational level, defies explanation. Personal friendships at the local level between practicing ODs and practicing OMDs was often good. There were many instances of two-way referral systems that worked not only for the benefit of the two professions, but also for the patients they shared. More than not, however, economic competition got in the way of cooperation. The infamous *PEN*, published by some ophthalmologists from Louisiana, was a vitriolic and malicious magazine. It was distributed to primary care physicians to influence them to not even think about referring patients with eye problems to optometrists. The *PEN* also was mailed to every legislator in every state each time it was published. When optometric state boards officially requested data to support the printed accusations "from many anonymous patients who went blind because of optometric care," the responses never came. Ever.

• Probably the major achievement by optometry, after the passage of the DPA and TPA legislation, was the approval by Congress of **optometric inclusion in the Medicare Act**. It took over 20 years to achieve. Regrettably, the original Medicare Act adopted in 1965 did not include optometry for eye examinations or for the prescribing of eyeglasses or contact lenses. The story of how Medicare did not permit optometrists to participate for more than two decades defies belief. Official ophthalmology convinced official optometry to opt out of Medicare in 1965 as dentistry had done. This could easily be accomplished by not making refractions or eyeglasses covered services. Only after the Medicare bill became law, ophthalmology introduced its medical eye exam that included everything but a refraction! Optometry had been hoodwinked! It took a determined manifold effort by the AOA and others that ended in a move by senator (then Congresswoman) Barbara Mikulski of Maryland to place an "earmark" in the Budget Reconciliation Bill of 1986. That earmark changed the definition of physician to include optometrists for Medicare reimbursements.

The more familiar visage of Dr. Bennett that decades of ODs have come to know.

THE BIGGEST CHANGE

I have only scratched the surface of the many changes that have happened during my lifetime. There are many more: the changes in instrumentation, not only for refractive purposes but also for disease detection and treatment are enormous; the optometric print media has changed not only in the subjects covered, but the substance in their coverage; and the congresses and conventions have gone from meetings primarily involving matters of concern for the organization to a substantial number of continuing education lectures. In the old days, there were no state laws requiring attendance of a specified number hours of continuing education lectures for license renewal.

All that being said, I must emphasize that the biggest change in optometry since I began practicing is image. Many optometrists of two generations ago were not really proud of their profession because of the limits on the scope of practice and because of an education that often was not as satisfying as one might expect. The name "optometrist" was not in the vocabulary of many. For years, most city newspapers followed the national *AP Stylebook* that recommended when to use the honorific *Doctor*. Editors refused to use the Dr. title before the name of an optometrist in a story the paper was carrying. It has been relatively recent that that has changed.

Today, the prestigious news magazine *US News and World Report* has listed optometry as one of the top vocations that can be recommended for people seeking a career. Optometry's image has changed for the better. And those who know the history will appreciate our current high esteem more and more. ■

Dr. Bennett practiced optometry in Beaver Falls, PA, for 46 years (1946-1992). He also was instrumental in the launch of OptiFair (the precursor to Vision Expo), Optometry Cares—The AOA Foundation and the publication Optometric Management.

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*When the ECP followed the fitting guide for the 3-Zone Progressive™ Design of PureVision®2 for Presbyopia lens.

REFERENCES: 1. Data on file. Bausch & Lomb Incorporated. Rochester, NY; 2013. **2.** Data on file. Bausch & Lomb Incorporated. Rochester, NY; 2015. **3.** Thirty-nine ECPs (from 10 countries) refitted 422 existing soft contact lens wearing presbyopes into PureVision®2 Presbyopia lenses. Patients returned for follow-up visits after 1-2 weeks. ECP assessment of lens performance including ease of fit, and patient satisfaction with lenses in real-world conditions, were measured using a 6-point agreement survey.

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WHEN THE RETINOSCOPE RULED

The earliest optometrists didn't need much more than this essential handheld instrument, an eye chart and an inquisitive mind.

BY MICHAEL RIVIELLO, ASSOCIATE EDITOR

An optometrist in 1891 likely spent his days doing refraction—and little else. Such was the primacy of vision assessment to the profession in its earliest incarnation. As optometry splintered off from opticianry in the late 19th century, it elevated the correction of refractive error to an art form. Gone were the days of so-called spectacle peddlers, who sold glasses out of a box and cajoled or flat-out bamboozled customers into thinking their resulting vision was the best it could be. Often, it was not.

With aspirations to more professional standards of evaluation and correction, optometry made its bones. The "oculist" physicians of the day didn't bother much with optics and refraction, as they were more concerned with eye health and disease. In the gap between the spectacle peddlers and the oculists, optometry flourished.

A look back at this publication's content during its first few decades reveals an optometric world in which articles on optics, vision testing and refractive correction methods were its stock in trade.

Over the years, refraction has remained a mainstay of the discipline even as attention shifted to ocular health when optometrists gained new rights and responsibilities in disease diagnosis and treatment.

FATHERS OF OPTOMETRY

Since its inception as *The Optician* in 1891, this publication has turned to thought leaders to share their perspectives and priorities, including the famous Charles Prentice and Andrew Cross, considered the "fathers of optometry."[1]

Drs. Prentice and Cross, complementing one another through their contrasting roles and strengths, propelled the profession to new intellectual and organizational heights.[1] Prentice "provided the spark" of ambition among refracting opticians for an appropriate professional identity and a legal status to match.[1] Prentice founded Columbia University's optometric program, and Cross, in turn, nurtured the program from its infancy as active director while also using his organizational acumen to lead the successful legislative campaign in New York State.[1]

Photo: Philip Tribble, Southern College of Optometry

Charles Prentice himself penned the first feature article in our debut issue in January 1891: "A Metric System of Numbering and Measuring Prisms." Building on other late 19th century publications of his, Prentice's article was ground-breaking—it tore down the old schema of prism numbering and finally took into account the indices of refraction in prism designation. No longer was the "wedge" used to number your prisms![2]

"Looking at the paper, well, I'm floored. It's not until 1891 that we get the first proposal for using the unit of measure we now call the prism diopter? Holy cow," says Paul Harris, OD, of Southern College of Optometry. "I would have expected that term to be around

from the earliest creation of lenses—this is astounding. To imagine prior to this they used the angular measure of the wedge!"

A 1901 article by Andrew Cross, "Dynamic Skiascopy, or the Control of Accommodation in Estimating Errors of Ocular Refraction with the Retino-skiameter," emphasized the imprecise nature of the art.[3] "There is no system at present," he says in the article, "that can determine absolutely the ocular refractive errors in every case, whether one is using objective or subjective methods."[3]

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DYNAMIC SKIASCOPY, OR THE CONTROLL OF ACCOMMODATION IN ESTIMATING ERRORS OF OCULAR REFRACTION WITH THE RETINO-SKIAMETER.

BY A. JAY CROSS, NEW YORK.

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Andrew Cross described and demonstrated his dynamic skiascopy technique in 1901, emphasizing the imprecise nature of the art.

Marc Taub, OD, of Southern College of Optometry, asserts the validity of Dr. Cross' work. "I love the first paragraph, in which he talks about the word 'estimating' in the title of the paper," says Dr. Taub, adding that Dr. Cross is correct in his statement that no systems exist that can be relied upon in all cases for the absolute determination of refractive error.

"Essentially, the data points of retinoscopy, refraction, binocular balance, etc., are just that—data points. They should not be taken as absolutes," says Dr. Taub. "Refractive correction is in fact a negotiation between examiner and patient."

Dr. Cross' description of the behavior of the shadow remains true, according to Dr. Taub, but he says that sometimes ODs miss the strategic mark. "Too often, practitioners are aimed at the number, and not the quality or behavior, he says. "The brightness, symmetry and behavior of the reflex tell you so much about the way a patient uses their visual system but you have to look!"

SEEING THE LIGHT

You didn't have to be a Prentice or a Cross to get published, however. Pick up any early issue of *The Optical Journal and Review of Optometry*—the publication's name from 1910 to 1977—and you'll find everyday refractionists sharing their techniques of vision testing with their colleagues, some of which still hold up today.

A piece from 1914, at the break of World War I, describes the key points of performing skiametry and retinoscopy. Written by R.L. Hill of Campbellsville, Ky., over a century ago, it nevertheless describes principles of practice that wouldn't be out of place in an optometric office of 2016, such as how illumination level affects outcomes.[4] "I never make the room too dark," Dr. Hill says, "for all the darkness we want is just enough to see distinctly the reflections from the mirror."[4]

The equipment, however, reflects a different era. "The lights that I use in skiametry," Dr. Hill says, "are situated behind and above my examination chair, being adjustable, so that when my patient is seated the light will be just behind and above his head." An obvious sign of the times: Dr. Hill's lights are "asbestos lined" to block light out except for at specific points and one inch in diameter in order to "cut off all rays of light excepting those we want to use," he says.[4]

He continues with the exam. After "throwing the light" across the meridian of the eye from right to left and back again, he makes note of the directions the light and shadows take with respect to the mirror and discerns its movements accordingly.[4] Using the hypothetical instance of the shadow going with the mirror, he says,"so I know by the reflected rays not focusing in front of me [that] my patient's far point is behind me, thus showing me that I have a case of low myopia, of hypermetropia, or that the eye is emmetropic, and that

Ancestors of Optometry

By Bill Kekevian, Senior Editor

No one knows for sure when spectacles were invented. The oldest known reference to spectacles in the Western world, however, dates to 1276 when Roger Bacon (philosopher, scientist, and—dubiously—alchemist) wrote of "a certain glass that made small letters appear larger."

It would take until the 1600s to figure out why certain lenses had that capability—or even how the anatomical lens works. The first to hypothesize the mechanism of the retina, Johannes Kepler, had to temporarily delay his life's work to defend his mother in trial against a charge of being a witch and casting spells.[1]

In those intervening 300 plus years, early physicians developed a disdain for spectacles and advised against their use.[2,3] Those who sold the "crude, ugly, unscientific" spectacles of this era "obeyed no mathematical laws."[2] Early ophthalmologists—"oculists" as they were known—such as the 16th century German Georg Bartisch, "bitterly opposed the use of spectacles."[3] With its oldest known ancestors "alchemists" and "street peddlers," optometry's reputation was sullied before it was even named.[2]

One hundred and seventy years after Kepler's mother was cleared of witchcraft, the world changed significantly. Notably, The American Revolution established a new nation. A citizen of that nation, John McAllister, opened the country's first optical shop in 1783.[4] After languishing for five years as a British prisoner of war—how fitting that the nation's first optometrist was jailed fighting for independence—he established a whip and cane business in Philadelphia. Looking to add to the scope of his wears, he purchased a small collection of spectacles, "not enough to fill a stove pipe hat," according to a family history written by his grandson.[4] The spectacles sold well and McAllister set out to not only make corrective lenses, but—at the behest of his friend, Benjamin Franklin—provide vision care.[5]

John McAllister's optical shop, Philadelphia, is considered the first in the nation.

While the venerated names of American revolutionaries survive, not so much as a plaque stands on the spot where optometry was born. However, this early image, preserved by the Library of Congress, captured McAllister's son, John McAllister, Jr., leaving the shop on June 17, 1843.[6]

1. Drew R. Professional Ophthalmic Dispensing. 1970. Professional Press, Inc. 3-14.
2. Kepler CM. 1993 Dover Books on Astronomy.
3. Tahran RL, Borish IM. A review of events leading to the development of modern optometry in the United States. Hindsight: The Journal of Optometry History. 2012;43(2):28-34.
4. Kelly C. Mcallister five generations in optometrics. Opt. J.-Rev. Optom. 1975;112(13):10-17.
5. Owens R. John McAllister, the father of optometry. POAeyes Post: Blog of the Pennsylvania Optometric Association. Updated: July 11, 2014. Accessed: March 30, 2016. http://poaeyes.blogspot.com/2014/07/john-mcallister-father-of-optometry.html.
6. Library of Congress. [No. 46 to No. 52, Chestnut Street, Philadelphia, Pennsylvania] color film copy transparency. www.loc.gov/resource/cph.3g09389/. Accessed: June 17, 2016.

it will take a plus lens to focus the reflected rays on my retina, or just in front of me."[4]

And so Dr. Hill neutralizes the motion of the shadow, "or barely reverses it," as he adds plus power/plus lenses in small increments, and takes into account the distance between himself and the patient to account for the correction in the meridian on which he is focusing.[4] "We will say that in this instance, it takes plus 3.00 D," he says, using two significant digits to the right of the decimal—Dr. Hill is a precise optometrist.[4] "So this meridian is hypermetropic to the amount of 3.00 D," he says. But, after taking into account the distance of one meter from his patient (the equivalent of 1.00 D), he deducts it and concludes with a final result of 2.00 D in the meridian.[4]

On several points, the article is incredibly relevant to today's refractionist. "With only minor—very minor—modifications, it could sound like advice from today," says Dr. Harris.

LOSING FOCUS?

In a time when ocular disease and surgical care garner the lion's share of attention, and autorefraction is a necessary tool to increase efficiency and patient convenience, has the profession lost focus on the art of refraction?

Some dilution was inevitable as the profession added new responsibilities, says Dr. Taub. "I think we saw a need to provide care, especially in rural areas, and filled the need. At some point, the health need

ADD SIMBRINZA® Suspension to a PGA for Even Lower IOP[1]*

INDICATIONS AND USAGE

SIMBRINZA® (brinzolamide/brimonidine tartrate ophthalmic suspension) 1%/0.2% is a fixed combination indicated in the reduction of elevated intraocular pressure (IOP) in patients with open-angle glaucoma or ocular hypertension.

Dosage and Administration

The recommended dose is one drop of SIMBRINZA® Suspension in the affected eye(s) three times daily. Shake well before use. SIMBRINZA® Suspension may be used concomitantly with other topical ophthalmic drug products to lower intraocular pressure. If more than one topical ophthalmic drug is being used, the drugs should be administered at least five (5) minutes apart.

IMPORTANT SAFETY INFORMATION

Contraindications

SIMBRINZA® Suspension is contraindicated in patients who are hypersensitive to any component of this product and neonates and infants under the age of 2 years.

Warnings and Precautions

Sulfonamide Hypersensitivity Reactions—Brinzolamide is a sulfonamide, and although administered topically, is absorbed systemically. Sulfonamide attributable adverse reactions may occur. Fatalities have occurred due to severe reactions to sulfonamides. Sensitization may recur when a sulfonamide is readministered irrespective of the route of administration. If signs of serious reactions or hypersensitivity occur, discontinue the use of this preparation.

Corneal Endothelium—There is an increased potential for developing corneal edema in patients with low endothelial cell counts.

Severe Hepatic or Renal Impairment (CrCl <30 mL/min)—SIMBRINZA® Suspension has not been specifically studied in these patients and is not recommended.

Contact Lens Wear—The preservative in SIMBRINZA® Suspension, benzalkonium chloride, may be absorbed by soft contact lenses. Contact lenses should be removed during instillation of SIMBRINZA® Suspension but may be reinserted 15 minutes after instillation.

Severe Cardiovascular Disease—Brimonidine tartrate, a component of SIMBRINZA® Suspension, had a less than 5% mean decrease in blood pressure 2 hours after dosing in clinical studies; caution should be exercised in treating patients with severe cardiovascular disease.

Adverse Reactions

SIMBRINZA® Suspension

In two clinical trials of 3 months' duration with SIMBRINZA® Suspension, the most frequent reactions associated with its use occurring in approximately 3-5% of patients in descending order of incidence included: blurred vision, eye irritation, dysgeusia (bad taste), dry mouth, and eye allergy. Adverse reaction rates with SIMBRINZA® Suspension were comparable to those of the individual components. Treatment discontinuation, mainly due to adverse reactions, was reported in 11% of SIMBRINZA® Suspension patients.

Prescribe SIMBRINZA® Suspension as adjunctive therapy to a PGA for appropriate patients

SIMBRINZA® Suspension should be taken at least five (5) minutes apart from other topical ophthalmic drugs

Learn more at myalcon.com/simbrinza

For additional information about SIMBRINZA® Suspension, please see Brief Summary of full Prescribing Information on adjacent page.

Reference: 1. Data on file, 2014.

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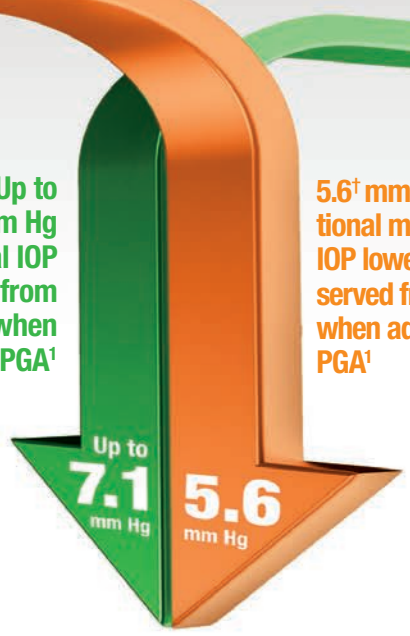
Up to 7.1 mm Hg additional IOP reduction from baseline when added to a PGA[1]

5.6† mm Hg additional mean diurnal IOP lowering observed from baseline when added to a PGA[1]



		IOP Time Points (mm Hg)[1‡]			
Treatment Arm		8 AM	10 AM	3 PM	5 PM
PGA + SIMBRINZA® Suspension (N=83)	Baseline[§]	24.5	22.9	21.7	21.6
	Week 6	19.4	15.8	17.2	15.6
PGA + Vehicle (N=92)	Baseline[§]	24.3	22.6	21.3	21.2
	Week 6	21.5	20.3	20.0	20.1

‡Least squares means at each Week 6 time point. Treatment differences (mm Hg) and *P*-values at Week 6 time points between treatment groups were: -2.14, *P*=0.0002; -4.56, *P*<0.0001; -2.84, *P*<0.0001; -4.42, *P*<0.0001.
§Baseline (PGA Monotherapy).

		Mean Diurnal IOP (mm Hg)[1‖]
Treatment Arm		
PGA + SIMBRINZA® Suspension (N=83)	Baseline[¶]	22.7
	Week 6	17.1
PGA + Vehicle (N=92)	Baseline[¶]	22.4
	Week 6	20.5

‖Treatment difference (mm Hg) and *P*-value at Week 6 was -3.4, *P*<0.0001.
¶Baseline (PGA Monotherapy).

Study Design: A prospective, randomized, multicenter, double-blind, parallel-group study of 189 patients with open-angle glaucoma and/or ocular hypertension receiving treatment with a PGA. PGA treatment consisted of either travoprost, latanoprost, or bimatoprost. Patients in the study were randomized to adjunctive treatment with SIMBRINZA® Suspension (N=88) or vehicle (N=94). The primary efficacy endpoint was mean diurnal IOP (IOP averaged over all daily time points) at Week 6 between treatment groups. Key secondary endpoints included IOP at Week 6 for each daily time point (8 AM, 10 AM, 3 PM, and 5 PM) and mean diurnal IOP change from baseline to Week 6 between treatment groups.[1]

*PGA study-group treatment consisted of either travoprost, latanoprost, or bimatoprost.
†Treatment difference (mm Hg) and *P*-value at Week 6 was -3.7, *P*<0.0001.

SIMBRINZA®
(brinzolamide/brimonidine tartrate ophthalmic suspension) 1%/0.2%

BRIEF SUMMARY OF PRESCRIBING INFORMATION
INDICATIONS AND USAGE

SIMBRINZA® (brinzolamide/brimonidine tartrate ophthalmic suspension) 1%/0.2% is a fixed combination of a carbonic anhydrase inhibitor and an alpha 2 adrenergic receptor agonist indicated for the reduction of elevated intraocular pressure (IOP) in patients with open-angle glaucoma or ocular hypertension.

DOSAGE AND ADMINISTRATION

The recommended dose is one drop of SIMBRINZA® Suspension in the affected eye(s) three times daily. Shake well before use. SIMBRINZA® Suspension may be used concomitantly with other topical ophthalmic drug products to lower intraocular pressure.
If more than one topical ophthalmic drug is being used, the drugs should be administered at least five (5) minutes apart.

DOSAGE FORMS AND STRENGTHS

Suspension containing 10 mg/mL brinzolamide and 2 mg/mL brimonidine tartrate.

CONTRAINDICATIONS

Hypersensitivity - SIMBRINZA® Suspension is contraindicated in patients who are hypersensitive to any component of this product.

Neonates and Infants (under the age of 2 years) - SIMBRINZA® Suspension is contraindicated in neonates and infants (under the age of 2 years*) see Use in Specific Populations*

WARNINGS AND PRECAUTIONS

Sulfonamide Hypersensitivity Reactions - SIMBRINZA® Suspension contains brinzolamide, a sulfonamide, and although administered topically is absorbed systemically. Therefore, the same types of adverse reactions that are attributable to sulfonamides may occur with topical administration of SIMBRINZA® Suspension. Fatalities have occurred due to severe reactions to sulfonamides including Stevens-Johnson syndrome, toxic epidermal necrolysis, fulminant hepatic necrosis, agranulocytosis, aplastic anemia, and other blood dyscrasias. Sensitization may recur when a sulfonamide is re-administered irrespective of the route of administration. If signs of serious reactions or hypersensitivity occur, discontinue the use of this preparation *[see Patient Counseling Information]*

Corneal Endothelium - Carbonic anhydrase activity has been observed in both the cytoplasm and around the plasma membranes of the corneal endothelium. There is an increased potential for developing corneal edema in patients with low endothelial cell counts. Caution should be used when prescribing SIMBRINZA® Suspension to this group of patients.

Severe Renal Impairment - SIMBRINZA® Suspension has not been specifically studied in patients with severe renal impairment (CrCl < 30 mL/min). Since brinzolamide and its metabolite are excreted predominantly by the kidney, SIMBRINZA® Suspension is not recommended in such patients.

Acute Angle-Closure Glaucoma - The management of patients with acute angle-closure glaucoma requires therapeutic interventions in addition to ocular hypotensive agents. SIMBRINZA® Suspension has not been studied in patients with acute angle-closure glaucoma.

Contact Lens Wear - The preservative in SIMBRINZA® Suspension, benzalkonium chloride, may be absorbed by soft contact lenses. Contact lenses should be removed during instillation of SIMBRINZA® Suspension but may be reinserted 15 minutes after instillation *[see Patient Counseling Information]*.

Severe Cardiovascular Disease - Brimonidine tartrate, a component of SIMBRINZA® Suspension, has a less than 5% mean decrease in blood pressure 2 hours after dosing in clinical studies; caution should be exercised in treating patients with severe cardiovascular disease.

Severe Hepatic Impairment - Because brimonidine tartrate, a component of SIMBRINZA® Suspension, has not been studied in patients with hepatic impairment, caution should be exercised in such patients.

Potentiation of Vascular Insufficiency - Brimonidine tartrate, a component of SIMBRINZA® Suspension, may potentiate syndromes associated with vascular insufficiency. SIMBRINZA® Suspension should be used with caution in patients with depression, cerebral or coronary insufficiency, Raynaud's phenomenon, orthostatic hypotension, or thromboangiitis obliterans.

Contamination of Topical Ophthalmic Products After Use - There have been reports of bacterial keratitis associated with the use of multiple-dose containers of topical ophthalmic products. These containers have been inadvertently contaminated by patients who, in most cases, had a concurrent corneal disease or a disruption of the ocular epithelial surface *[see Patient Counseling Information]*.

ADVERSE REACTIONS

Clinical Studies Experience - Because clinical studies are conducted under widely varying conditions, adverse reaction rates observed in the clinical studies of a drug cannot be directly compared to the rates in the clinical studies of another drug and may not reflect the rates observed in practice.

SIMBRINZA® Suspension - In two clinical trials of 3 months duration 435 patients were treated with SIMBRINZA® Suspension, and 915 were treated with the two individual components. The most frequently reported adverse reactions in patients treated with SIMBRINZA® Suspension occurring in approximately 3 to 5% of patients in descending order of incidence were blurred vision, eye irritation, dysgeusia (bad taste), dry mouth, and eye allergy. Rates of adverse reactions reported with the individual components were comparable. Treatment discontinuation, mainly due to adverse reactions, was reported in 11% of SIMBRINZA® Suspension patients.

Other adverse reactions that have been reported with the individual components during clinical trials are listed below.

Brinzolamide 1% - In clinical studies of brinzolamide ophthalmic suspension 1%, the most frequently reported adverse reactions reported in 5 to 10% of patients were blurred vision and bitter, sour or unusual taste. Adverse reactions occurring in 1 to 5% of patients were blepharitis, dermatitis, dry eye, foreign body sensation, headache, hyperemia, ocular discharge, ocular discomfort, ocular keratitis, ocular pain, ocular pruritus and rhinitis.

The following adverse reactions were reported at an incidence below 1%: allergic reactions, alopecia, chest pain, conjunctivitis, diarrhea, diplopia, dizziness, dry mouth, dyspnea, dyspepsia, eye fatigue, hypertonia, keratoconjunctivitis, keratopathy, kidney pain, lid margin crusting or sticky sensation, nausea, pharyngitis, tearing and urticaria.

Brimonidine Tartrate 0.2% - In clinical studies of brimonidine tartrate 0.2%, adverse reactions occurring in approximately 10 to 30% of the subjects, in descending order of incidence, included oral dryness, ocular hyperemia, burning and stinging, headache, blurring, foreign body sensation, fatigue/drowsiness, conjunctival follicles, ocular allergic reactions, and ocular pruritus.

Reactions occurring in approximately 3 to 9% of the subjects, in descending order included corneal staining/erosion, photophobia, eyelid erythema, ocular ache/pain, ocular dryness, tearing, upper respiratory symptoms, eyelid edema, conjunctival edema, dizziness, blepharitis, ocular irritation, gastrointestinal symptoms, asthenia, conjunctival blanching, abnormal vision and muscular pain.

The following adverse reactions were reported in less than 3% of the patients: lid crusting, conjunctival hemorrhage, abnormal taste, insomnia, conjunctival discharge, depression, hypertension, anxiety, palpitations/arrhythmias, nasal dryness and syncope.

Postmarketing Experience - The following reactions have been identified during postmarketing use of brimonidine tartrate ophthalmic solutions in clinical practice. Because they are reported voluntarily from a population of unknown size, estimates of frequency cannot be made. The reactions, which have been chosen for inclusion due to either their seriousness, frequency of reporting, possible causal connection to brimonidine tartrate ophthalmic solutions, or a combination of these factors, include: bradycardia, hypersensitivity, iritis, keratoconjunctivitis sicca, miosis, nausea, skin reactions (including erythema, eyelid pruritus, rash, and vasodilation), and tachycardia.

Apnea, bradycardia, coma, hypotension, hypothermia, hypotonia, lethargy, pallor, respiratory depression, and somnolence have been reported in infants receiving brimonidine tartrate ophthalmic solutions *[see Contraindications]*.

DRUG INTERACTIONS

Oral Carbonic Anhydrase Inhibitors - There is a potential for an additive effect on the known systemic effects of carbonic anhydrase inhibition in patients receiving an oral carbonic anhydrase inhibitor and brinzolamide ophthalmic suspension 1%, a component of SIMBRINZA® Suspension. The concomitant administration of SIMBRINZA® Suspension and oral carbonic anhydrase inhibitors is not recommended.

High-Dose Salicylate Therapy - Carbonic anhydrase inhibitors may produce acid-base and electrolyte alterations. These alterations were not reported in the clinical trials with brinzolamide ophthalmic suspension 1%. However, in patients treated with oral carbonic anhydrase inhibitors, rare instances of acid-base alterations have occurred with high-dose salicylate therapy. Therefore, the potential for such drug interactions should be considered in patients receiving SIMBRINZA® Suspension.

CNS Depressants - Although specific drug interaction studies have not been conducted with SIMBRINZA® Suspension, the possibility of an additive or potentiating effect with CNS depressants (alcohol, opiates, barbiturates, sedatives, or anesthetics) should be considered.

Antihypertensives/Cardiac Glycosides - Because brimonidine tartrate, a component of SIMBRINZA® Suspension, may reduce blood pressure, caution in using drugs such as antihypertensives and/or cardiac glycosides with SIMBRINZA® Suspension is advised.

Tricyclic Antidepressants - Tricyclic antidepressants have been reported to blunt the hypotensive effect of systemic clonidine. It is not known whether the concurrent use of these agents with SIMBRINZA® Suspension in humans can lead to resulting interference with the IOP lowering effect. Caution is advised in patients taking tricyclic antidepressants which can affect the metabolism and uptake of circulating amines.

Monoamine Oxidase Inhibitors - Monoamine oxidase (MAO) inhibitors may theoretically interfere with the metabolism of brimonidine tartrate and potentially result in an increased systemic side-effect such as hypotension. Caution is advised in patients taking MAO inhibitors which can affect the metabolism and uptake of circulating amines.

USE IN SPECIFIC POPULATIONS

Pregnancy - *Pregnancy Category C:* Developmental toxicity studies with brinzolamide in rabbits at oral doses of 1, 3, and 6 mg/kg/day (20, 60, and 120 times the recommended human ophthalmic dose) produced maternal toxicity at 6 mg/kg/day and a significant increase in the number of fetal variations, such as accessory skull bones, which was only slightly higher than the historic value at 1 and 6 mg/kg. In rats, statistically decreased body weights of fetuses from dams receiving oral doses of 18 mg/kg/day (180 times the recommended human ophthalmic dose) during gestation were proportional to the reduced maternal weight gain, with no statistically significant effects on organ or tissue development. Increases in unossified sternebrae, reduced ossification of the skull, and unossified hyoid that occurred at 6 and 18 mg/kg were not statistically significant. No treatment-related malformations were seen. Following oral administration of ^{14}C-brinzolamide to pregnant rats, radioactivity was found to cross the placenta and was present in the fetal tissues and blood.

Developmental toxicity studies performed in rats with oral doses of 0.66 mg brimonidine base/kg revealed no evidence of harm to the fetus. Dosing at this level resulted in a plasma drug concentration approximately 100 times higher than that seen in humans at the recommended human ophthalmic dose. In animal studies, brimonidine crossed the placenta and entered into the fetal circulation to a limited extent.

There are no adequate and well-controlled studies in pregnant women. SIMBRINZA® Suspension should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Nursing Mothers - In a study of brinzolamide in lactating rats, decreases in body weight gain in offspring at an oral dose of 15 mg/kg/day (150 times the recommended human ophthalmic dose) were observed during lactation. No other effects were observed. However, following oral administration of ^{14}C-brinzolamide to lactating rats, radioactivity was found in milk at concentrations below those in the blood and plasma. In animal studies, brimonidine was excreted in breast milk.

It is not known whether brinzolamide and brimonidine tartrate are excreted in human milk following topical ocular administration. Because many drugs are excreted in human milk and because of the potential for serious adverse reactions in nursing infants from SIMBRINZA® (brinzolamide/brimonidine tartrate ophthalmic suspension) 1%/0.2%, a decision should be made whether to discontinue nursing or to discontinue the drug, taking into account the importance of the drug to the mother.

Pediatric Use - The individual component, brinzolamide, has been studied in pediatric glaucoma patients 4 weeks to 5 years of age. The individual component, brimonidine tartrate, has been studied in pediatric patients 2 to 7 years old. Somnolence (50-83%) and decreased alertness was seen in patients 2 to 6 years old. SIMBRINZA® Suspension is contraindicated in children under the age of 2 years *[see Contraindications]*.

Geriatric Use - No overall differences in safety or effectiveness have been observed between elderly and adult patients.

OVERDOSAGE

Although no human data are available, electrolyte imbalance, development of an acidotic state, and possible nervous system effects may occur following an oral overdose of brinzolamide. Serum electrolyte levels (particularly potassium) and blood pH levels should be monitored.

Very limited information exists on accidental ingestion of brimonidine in adults; the only adverse event reported to date has been hypotension. Symptoms of brimonidine overdose have been reported in neonates, infants, and children receiving brimonidine as part of medical treatment of congenital glaucoma or by accidental oral ingestion. Treatment of an oral overdose includes supportive and symptomatic therapy; a patent airway should be maintained.

PATIENT COUNSELING INFORMATION

Sulfonamide Reactions - Advise patients that if serious or unusual ocular or systemic reactions or signs of hypersensitivity occur, they should discontinue the use of the product and consult their physician.

Temporary Blurred Vision - Vision may be temporarily blurred following dosing with SIMBRINZA® Suspension. Care should be exercised in operating machinery or driving a motor vehicle.

Effect on Ability to Drive and Use Machinery - As with other drugs in this class, SIMBRINZA® Suspension may cause fatigue and/or drowsiness in some patients. Caution patients who engage in hazardous activities of the potential for a decrease in mental alertness.

Avoiding Contamination of the Product - Instruct patients that ocular solutions, if handled improperly or if the tip of the dispensing container contacts the eye or surrounding structures, can become contaminated by common bacteria known to cause ocular infections. Serious damage to the eye and subsequent loss of vision may result from using contaminated solutions *[see Warnings and Precautions]*. Always replace the cap after using. If solution changes color or becomes cloudy, do not use. Do not use the product after the expiration date marked on the bottle.

Intercurrent Ocular Conditions - Advise patients that if they have ocular surgery or develop an intercurrent ocular condition (e.g., trauma or infection), they should immediately seek their physician's advice concerning the continued use of the present multidose container.

Concomitant Topical Ocular Therapy - If more than one topical ophthalmic drug is being used, the drugs should be administered at least five minutes apart.

Contact Lens Wear - The preservative in SIMBRINZA® Suspension, benzalkonium chloride, may be absorbed by soft contact lenses. Contact lenses should be removed during instillation of SIMBRINZA® Suspension, but may be reinserted 15 minutes after instillation.

U.S. Patent No:
6,316,441

ALCON LABORATORIES, INC.
Fort Worth, Texas 76134 USA
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alcon.medinfo@alcon.com

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seems to have pushed refractive care to the side." He says that this took place even though optometrists, on average, spend at least half of their exam time on the refractive aspects of the visit.

"Even before students leave optometric education, there is a push to drop examination components that do not seem to serve a purpose," says Dr. Taub. "Asking the patients or their families questions regarding school performance, birth history or social development gets thrown out the window." And tests of binocular vision and accommodation are often cursory, he notes.

"We cannot blame this all on the commercialization of care," Dr. Taub says. "I know plenty of caregivers at commercial locations that make wonderful referrals to our clinic while others at private offices rarely make such referrals."

Dr. Harris says new technologies and the need to see more patients played a role in refraction falling by the wayside to the extent that it has. "Retinoscopy was a mainstay tool to establish our refractive starting position," Dr. Harris says. "Then along came the autorefractor. It was an amazing application of autofocusing technology, which promised to reduce chair time and improve refractions, and it could be done by staff before the doctor ever even got into the room."

Over time, though, he suggests, optometrists recognized the limitations of the autorefractor and are starting to shift back to emphasizing the role of the retinoscope. "With the return to using this valuable tool has come the additional insights derived from the brightness and color of the reflex and from the variations in both over time along with many other subtleties which have been documented over the years," says Dr. Taub. "Is there a place for autorefractors? Yes, but the cases are fewer than we suspected."

Mark Wilkinson, OD, of the University of Iowa's Carver College of Medicine, finds the timing ironic, as the shift comes in an era when 20/20 uncorrected vision after surgery is prized more than ever before. "The goal is emmetropia for patients after refractive surgery as well as cataract surgery, so it is critically important to know exactly what their refractive errors are before surgical intervention."

Yet, he says many optometrists and ophthalmologists rely on technicians and/or autorefraction to do the job. "Autorefractors can help in many cases. That said, I think that I can do what an autorefractor can do as fast, or faster, and as or more accurately, with a retinoscope."

A few Victorian-era ads from *The Optical Journal*. Above is the Javal-Schiøtz Ophthalmometer; left, an eye chart from Wall & Ochs opticians in Philadelphia.

"I think optometry has pushed itself to focus more on eye disease evaluation and management," deemphasizing refraction, says Dr. Wilkinson. "With optometry working to expand the level of care they can provide, for very good reasons, the time it took to learn these new skills took away from the time that was spent learning to be good refractionists," says Dr. Wilkinson. Refraction, he says, "is and should continue to be a cornerstone of what optometry does."

Optometrists are just now beginning to contend with a new model of vision testing—and of doing business—that could prove disruptive: online refractions.

This new concept in refractive eye care is more than just a direct threat to the livelihood of an optometrist. It represents a dispiriting denigration of vision testing, a once-proud tradition that requires keen intellect and careful attention. If online exams take off with the public, the quality and thoroughness of the refraction will be sacrificed in the rush to fill an Rx. What might the high-minded practitioners of the late 19th century think of the hasty and hurried refraction one can get today with a click of a mouse? "The spectacle peddlers are back," perhaps. ■

1. Cox ME. Optometry, the Profession: Its Antecedents, Birth, and Development. Chilton Co., 1947.
2. Prentice C. A mteric system of numbering and measuring prisms. The Optical Journal. Jan 1891;1(1).
3. Cross J. Dynamic Skiascopy, or the controll of accommodation in estimating errors of ocular refraction with the retino-skiamter. The Optical Journal.1901.
4. Hill RL. Static and dynamic skiametry. The Optical Journal. 12 March 1914.

PATENTLY ABSURD

Early drug ads were rife with wild claims that promised too much. Modern ones, hemmed in by regulations, say too little.

BY JOSEPH W. SOWKA, OD, AND ALAN G. KABAT, OD

The evolution of pharmaceutic marketing in eye care over the past century is fascinating. The earliest ads—those from the patent medicine era of the late 19th century—promoted cures for all manner of eye conditions with little, if any, information on their efficacy and safety. No mentions of active ingredients existed, only a prodigious list of ailments each product would cure. In fact, about the only claim not made is the ability to cure blindness.

It appears that the most important selling point for these potions was a product endorsement from one of "the greatest ophthalmic surgeons" or other similar individuals of excellent repute. Apparently, the only requirement for safety and efficacy was to have a bloated pundit endorse the product. In this respect, perhaps, times haven't really changed that much.


AN INVALUABLE EYE REMEDY.
THE GREAT GERMAN EYE WATER
From the Original Prescription of the late Dr. Agnew.

A harmless preparation with wonderful curative properties. Its immediate effect in cases o chronic or acute conjunctivitis, bletharitis, or; scaly eyelids, burning, smarting, or itching of the eyes or inflammation from *any cause* is phenominal.

25 years on the market. Sold by thousands of jewelers and opticians, with great satisfaction.

This formula **IS NOT** the product of any optician or eye specialist **BUT IS** from one of America's greatest Ophthalmic Surgeons.

Dr. Agnew's portrait is on every box.

Price $19.50 per gross. $1.63 per doz. Customer's business card on each bottle if 6 dozen or more are ordered.

Order from your jobber or direct from the proprietor.

W. F. CUSHMAN, 711 Boylston Street, Boston, Mass.

Fig. 1. "Dr. Agnew's portrait is on every box" assures this 1901 ad that trades on the name of "one of America's greatest Ophthalmic Surgeons."

Reproduced here are a few representative ads that ran in *The Optical Journal* from the period 1895-1901. Let's consider what they say about the culture of their era—and ours.

FAITH HEALERS

In truth, some of these products may actually have lived up to at least a few of their claims, though the efficacy may lie in the faith of the patient more than the ingredients in the bottle. The "Great German Eye Water" as seen in *Figure 1* probably did flush away allergens, relieve itching and lubricate dry eyes. Likely there wasn't anything more in this product than readily available drinking water, but it's quite possible that the inclusion of the portrait on the bottle—the great Dr. Agnew—led to a significant placebo effect.

This concept is actually reasonable. Experts say a relationship exists between how strongly a person expects to see results from a treatment and the likelihood that the treatment elicits some effect. The interaction between a patient and health care provider can be substantial in terms of generating such an effect.[1] Thus, a patient's belief that Dr. Agnew himself held valid the miraculous claims of the product may have been enough to create a placebo effect.

Same goes for Dr. Lawton's Eye Lotion from 1895, seen in *Figure 2*, which trades on the name of its propri-

etor to influence both the Victorian "opticians and jewelers" who stocked it as well as the customers to whom they resold it.

PFLOGGING IT

Antiphlogistine is a rubefacient introduced in 1893 by Denver Chemical of New York, though this ad, seen in *Figure 3,* dates to 1901 from a pair of New Hampshire optometrists, Brown & Burpee. Produced and available in Canada to this day, it is a popular product for the treatment of tough muscle, arthritic and rheumatic pains, as well as bursitis.

Rubefacients are topically applied and produce redness of the skin through capillary dilation; subsequently, they increase vascular circulation. While this mechanism explains the possible effects of antiphlogistine and rubefacients on inflammation, no evidence exists to support their use for this indication. When applied to the eye or periorbital region, local effects could be perceived as beneficial (the ad does not state how the potion is to be used). The assumption by the patient may be that if it burned when applied to the eye—as it seems likely it would—then it must be working.

Murine is a product of old still available in many formulations. The original ads *(Figure 4)*, some even appearing on the cover of this magazine, claimed it "made weak eyes strong" and "rapidly restores an inflamed eye to its natural condition." The vagueness of the first boast would be impossible to verify. However, Murine has long contained a vasoconstrictive agent, which could induce vasoconstriction and superficially reduce inflammation (though not as thoroughly as a steroid). There is no way to verify the active ingredient in the original product because, typical for that time, no list of ingredients existed for reference. A visit to the current product's website clearly identifies all components in all variations of the murine product: naphazoline HCl 0.12mg/ml, boric acid, borax hypromellose, purified water, edetate disodium and benzalkonium chloride. Whether these ingredients have varied over time from the original formulation touted as a panacea back in 1899 is yet another mystery unlikely to be unraveled.

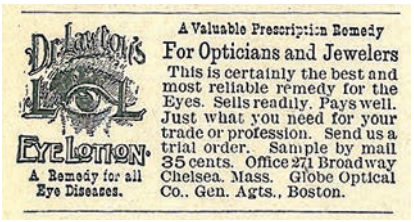

Fig. 2. This 1895 ad hawks an "eye lotion" that "sells readily."

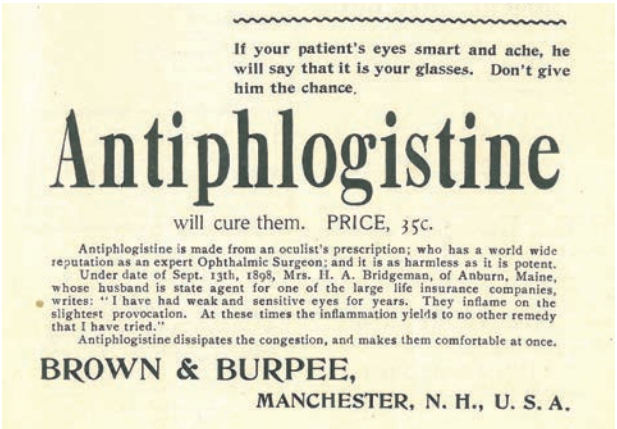

Fig. 3. "It is as harmless as it is potent," claims this 1901 ad.

MARKETING TODAY

Medications now come with detailed product inserts wherein manufacturers list every known contraindication and adverse effect, but only a narrow sliver of detail on their use, as indications and dosing are beholden to the study design of the pivotal trials—in effect, a 180° turn from how it was a century ago.

When physicians do present promotional talks for new drugs, they are typically given a company-derived promotional presentation that emphasizes adverse effects—speakers are not allowed to stray from the message or modify the talk in any way. Regulations now dictate that we either refrain from speaking of any non-labeled uses of a medication or expressly state that a suggested use is off-label.

Drug companies now try to influence physician prescribing habits by appealing to the most sacred customers—their patients—through direct marketing on television and in print. These direct-marketing drug ads implore patients to "ask your doctor" about the appropriateness of the therapy. While print ads now contain powerful graphics designed to garner patients' attention, turn the page and you will find at least another page of small print detailing risks and safety precautions. These warnings are so prevalent, in fact, that one wonders why anyone would want to use the product in the first place.

But even with safeguards in place, the balance can still be off the mark. Recently, a new generation of blood thinners led to a spike in deaths (relative to the standard-bearers in anticoagulants like warfarin) from uncontrolled bleeding. The blood thinners were touted in commercials as more convenient than warfarin because

they require less monitoring. Hailed by the likes of Arnold Palmer, the novel anticoagulants were supposed to make life easier. But those benefits came with risks that, when ignored, ultimately resulted in potentially avoidable deaths. Since then, warnings now seem to feature prominently in commercials of Mr. Palmer hitting a golf ball. While the warning statement existed all along, "May result in uncontrollable bleeding" now catches one's ear more easily. Is it appropriate for that to be the lingering message patients take away?

Other times, manufacturers overpromote a particularly favorable study outcome. For example, the opiate abuse epidemic has been exacerbated by overprescription justified by the results of one study—now known to be false—which stated that the adverse effects of prescribing opiates were minimal. Educators used the study to influence an entire generation of physicians. And it wasn't long ago that drug reps themselves also roamed the medical schools, soliciting these clinicians to use their company's drugs.

These examples, amid myriad others, reflect the disjointed and somewhat schizophrenic modern approach to pharmaceutical marketing: use advertising's tools of persuasion, but undercut the message with a litany of warnings; hire doctors to educate, but keep them from speaking freely about what they know to be true.

Fig. 4. Murine was big business at the turn of the century, even getting ad space on the magazine cover. The workhorse drug was apparently able to "cure" an array of ills including "cyclist's eyes" and "children's eyes." Plus, it's an "eye food," too!

NO GOING BACK

In spite of our contemporary concerns, remember where we came from. We concern ourselves with the possibility of conflicts of interest at conferences and worry that our patients cannot afford a drug. But, better that we debate which drug is right for our patients based on both cost and efficacy than to sell them a bottle with a famous face on it and hope for improvement through faith in the portraits of the Dr. Agnews of the present day.

While many physicians may wring their hands over the sometimes glacial pace of medication approval, few would disagree that knowing the effectiveness and safety of approved medications is a must. So it comes down to this: We can go back to a time when untested potions promised the world and doctors had no way to verify the claims, or we can deal with the FDA, warts and all, a regulatory body that has provided a level of public protection from the would-be snake oil salesmen of our own time. ■

FDA FACTS

The Food and Drug Administration—created in 1927 partly in response to such cavalier marketing, and given greater regulatory power in 1938—is responsible for protecting the public health by assuring the safety, efficacy and security of human and veterinary drugs, biological products, medical devices, our nation's food supply, cosmetics and products that emit radiation.[3] Most doctors are at least vaguely aware of the FDA's role, and yet many view the regulatory body as an impediment to rapid progress in health care. In spite of this perception, the organization plays a vital role in ensuring the claims of medical products are grounded in solid science—not speculation or sophistry as in the freewheeling ads of yore.

The FDA is also responsible for advancing public health by helping to speed innovations that make drugs more effective, safer and more affordable, and by helping the public obtain accurate, science-based information to make informed decisions on medications and foods. The agency also regulates the manufacturing, marketing and distribution of tobacco products to protect the public health and to reduce tobacco use by minors.[3]

Finally, the FDA plays a significant role in the nation's counterterrorism capability. It fulfills this responsibility by ensuring the security of the food supply and by fostering development of medical products to respond to deliberate and naturally occurring public health threats.[3]

1. WebMD. The Placebo Effect: What Is It? WebMD. www.webmd.com/pain-management/what-is-the-placebo-effect?page=2. Updated 2/23/2016. Accessed June 2016.
2. Care Pharmaceuticals. www.murine.com.au/products/eye-drops/murine-clear-eyes. Murine. Accessed June 2016.
3. Food and Drug Administration. What We Do. www.fda.gov/AboutFDA/WhatWeDo. Accessed June 2016.

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BRIDGING THE GENERATION GAP

Before ODs had either legal or technological ability to diagnose the way they do today, how did they practice? One doctor asks his optometrist father.

BY ANDREW S. GURWOOD, OD

What is the most valuable link to history? Is it the bulging file folders stuffed with yellowing texts lining the cabinets of the state hall? Conclusions reached by academic researchers? Until humanity unlocks the key to actually traveling to the past, perhaps the best resource for historical understanding is the people who lived it.

If nothing else, the editors of *Review of Optometry* have learned that the men and women who practiced in the 1960s, 1950s and even 1940s have been sitting on a goldmine of insight. The stories of their lives aren't theirs alone. They are brush strokes in the grander image that makes up the history of optometric care. You too can access these treasure troves. It may not be as easy for you as it is for Andrew S. Gurwood, OD, whose own father, Irving Gurwood, OD, 74, taught at the Pennsylvania College of Optometry (PCO) starting in the early 1970s, when available diagnostic care was rudimentary at best. Between them, the two have some 80 years experience.

Dr. Gurwood spent this Father's Day talking to someone who was not just a literal father to him, but one of a class of paternal figures to every OD in America today. Here, Dr. Irving Gurwood, 74, discusses the times, people and events that drove innovations in diagnostic technology, interviewed by his son, Andy.

Andrew: *Before joining PCO, you served in the US Army. When did you get out of the service?*

Irving: I finished my two-year commitment to the draft in 1968, then I went to two-year active reserve, and then a two-year inactive reserve.

So, you could numb the eye at that time?

In the service, we could.

What about outside the service?

Outside the service, we were not really allowed to use any diagnostic drugs. At the time I saw patients and we did mostly refractions and evaluations without the use of pharmaceuticals by using ophthalmoscopy.

What if you saw conjunctivitis? Would they let you suggest antibiotics?

No, the ophthalmologist would take over at that point.

How could you function in practice without diagnostic or therapeutic drugs when you had patients who needed them? Did you even have a slit lamp?

Yes. We learned to use a slit lamp in the service and we had limited slit lamps at the college. In my own office, I had a Neitz slit lamp. Just before I graduated, the Mackay-Marg tonometer came out, which did not require anesthesia of the cornea if you used a light touch.

I'm familiar with the Mackay-Marg. It gives a reading similar to today's historometer, where you read a piece of graph paper to determine the pressure. In fact, I remember you had two in your office.

That's correct.

Did you know Joe Toland?

I knew him. He was coming to the clinic on a one-day-a-week basis. I consider him one of the fathers of modern optometry. Irv Borish, OD, is certainly another. He had written textbooks. He was a good lecturer and a good writer, but the next phase of optometry—which brought us to diagnostic drugs—was primarily brought

For allergic conjunctivitis[1]

THE POWER TO CALM THE ITCH

BEPREVE®—FIRST-LINE, YEAR-ROUND, WITH BROAD-SPECTRUM ALLERGEN COVERAGE

INDICATION AND USAGE

BEPREVE® (bepotastine besilate ophthalmic solution) 1.5% is a histamine H_1 receptor antagonist indicated for the treatment of itching associated with allergic conjunctivitis.

IMPORTANT SAFETY INFORMATION

- BEPREVE® is contraindicated in patients with a history of hypersensitivity reactions to bepotastine or any of the other ingredients.
- BEPREVE® is for topical ophthalmic use only. To minimize risk of contamination, do not touch the dropper tip to the eyelids or to any surface. Keep the bottle closed when not in use.
- BEPREVE® should not be used to treat contact lens-related irritation. Remove contact lens prior to instillation of BEPREVE®. Lenses may be reinserted 10 minutes after BEPREVE® administration.
- The most common adverse reaction occurring in approximately 25% of patients was a mild taste following instillation. Other adverse reactions occurring in 2%-5% of patients were eye irritation, headache, and nasopharyngitis.

Made by the respected eye-care specialists at BAUSCH + LOMB

Please see the accompanying full Prescribing Information for BEPREVE® on the following page.

Reference: 1. BEPREVE [package insert]. Tampa, FL: Bausch & Lomb Incorporated; 2012.

BAUSCH + LOMB

For product-related questions and concerns, call **1-800-323-0000** or visit **www.bausch.com**.

BEPREVE®
(bepotastine besilate ophthalmic solution) 1.5%

BEPREVE® (bepotastine besilate ophthalmic solution) 1.5%

HIGHLIGHTS OF PRESCRIBING INFORMATION
These highlights do not include all the information needed to use BEPREVE® (bepotastine besilate ophthalmic solution) 1.5% safely and effectively. See full prescribing information for BEPREVE®.

BEPREVE® (bepotastine besilate ophthalmic solution) 1.5%
Initial U.S. Approval: 2009

----------RECENT MAJOR CHANGES----------
Contraindications (4) 06/2012

----------INDICATIONS AND USAGE----------
BEPREVE® is a histamine H1 receptor antagonist indicated for the treatment of itching associated with allergic conjunctivitis. (1)

----------DOSAGE AND ADMINISTRATION----------
Instill one drop into the affected eye(s) twice a day (BID). (2)

----------DOSAGE FORMS AND STRENGTHS--------
Solution containing bepotastine besilate, 1.5%. (3)

----------CONTRAINDICATIONS----------
Hypersensitivity to any component of this product. (4)

----------WARNINGS AND PRECAUTIONS----------
- To minimize the risk of contamination, do not touch dropper tip to any surface. Keep bottle tightly closed when not in use. (5.1)
- BEPREVE should not be used to treat contact lens-related irritation. (5.2)
- Remove contact lenses prior to instillation of BEPREVE. (5.2)

----------ADVERSE REACTIONS----------
The most common adverse reaction occurring in approximately 25% of patients was a mild taste following instillation. Other adverse reactions which occurred in 2-5% of subjects were eye irritation, headache, and nasopharyngitis. (6)

To report SUSPECTED ADVERSE REACTIONS, contact Bausch & Lomb Incorporated. at 1-800-323-0000, or FDA at 1-800-FDA-1088 or www.fda.gov/medwatch.
See 17 for PATIENT COUNSELING INFORMATION

Revised: 10/2012

FULL PRESCRIBING INFORMATION: CONTENTS*

*Sections or subsections omitted from the full prescribing information are not listed

FULL PRESCRIBING INFORMATION

1 INDICATIONS AND USAGE
BEPREVE® (bepotastine besilate ophthalmic solution) 1.5% is a histamine H_1 receptor antagonist indicated for the treatment of itching associated with signs and symptoms of allergic conjunctivitis.

2 DOSAGE AND ADMINISTRATION
Instill one drop of BEPREVE into the affected eye(s) twice a day (BID).

3 DOSAGE FORMS AND STRENGTHS
Topical ophthalmic solution containing bepotastine besilate 1.5%.

4 CONTRAINDICATIONS
Bepreve is contraindicated in patients with a history of hypersensitivity reactions to bepotastine or any of the other ingredients *[see Adverse Reactions (6.2)]*.

5 WARNINGS AND PRECAUTIONS
5.1 Contamination of Tip and Solution
To minimize contaminating the dropper tip and solution, care should be taken not to touch the eyelids or surrounding areas with the dropper tip of the bottle. Keep bottle tightly closed when not in use.

5.2 Contact Lens Use
Patients should be advised not to wear a contact lens if their eye is red. BEPREVE should not be used to treat contact lens-related irritation.

BEPREVE should not be instilled while wearing contact lenses. Remove contact lenses prior to instillation of BEPREVE. The preservative in BEPREVE, benzalkonium chloride, may be absorbed by soft contact lenses. Lenses may be reinserted after 10 minutes following administration of BEPREVE.

5.3 Topical Ophthalmic Use Only
BEPREVE is for topical ophthalmic use only.

6 ADVERSE REACTIONS
6.1 Clinical Trials Experience
Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates observed in clinical practice.

The most common reported adverse reaction occurring in approximately 25% of subjects was a mild taste following instillation. Other adverse reactions occurring in 2-5% of subjects were eye irritation, headache, and nasopharyngitis.

6.2 Post Marketing Experience
Hypersensitivity reactions have been reported rarely during the post-marketing use of BEPREVE. Because these reactions are reported voluntarily from a population of unknown size, it is not always possible to reliably estimate their frequency or establish a casual relationship to drug exposure. The hypersensitivity reactions include itching, body rash, and swelling of lips, tongue and/or throat.

8 USE IN SPECIFIC POPULATIONS
8.1 Pregnancy
Pregnancy Category C: Teratogenicity studies have been performed in animals. Bepotastine besilate was not found to be teratogenic in rats during organogenesis and fetal development at oral doses up to 200 mg/kg/day (representing a systemic concentration approximately 3,300 times that anticipated for topical ocular use in humans), but did show some potential for causing skeletal abnormalities at 1,000 mg/kg/day. There were no teratogenic effects seen in rabbits at oral doses up to 500 mg/kg/day given during organogenesis and fetal development (>13,000 times the dose in humans on a mg/kg basis). Evidence of infertility was seen in rats given oral bepotastine besilate 1,000 mg/kg/day; however, no evidence of infertility was observed in rats given 200 mg/kg/day (approximately 3,300 times the topical ocular use in humans). The concentration of radio-labeled bepotastine besilate was similar in fetal liver and maternal blood plasma following a single 3 mg/kg oral dose. The concentration in other fetal tissues was one-third to one-tenth the concentration in maternal blood plasma.

An increase in stillborns and decreased growth and development were observed in pups born from rats given oral doses of 1,000 mg/kg/day during perinatal and lactation periods. There were no observed effects in rats treated with 100 mg/kg/day.

There are no adequate and well-controlled studies of bepotastine besilate in pregnant women. Because animal reproduction studies are not always predictive of human response, BEPREVE® (bepotastine besilate ophthalmic solution) 1.5% should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

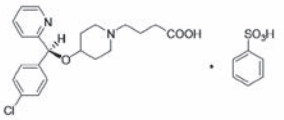
8.3 Nursing Mothers
Following a single 3 mg/kg oral dose of radiolabeled bepotastine besilate to nursing rats 11 days after delivery, the maximum concentration of radioactivity in milk was 0.40 mcg-eq/mL 1 hour after administration; at 48 hours after administration the concentration was below detection limits. The milk concentration was higher than the maternal blood plasma concentration at each time of measurement.

It is not known if bepotastine besilate is excreted in human milk. Caution should be exercised when BEPREVE (bepotastine besilate ophthalmic solution) 1.5% is administered to a nursing woman.

8.4 Pediatric Use
Safety and efficacy of BEPREVE (bepotastine besilate ophthalmic solution) 1.5% have not been established in pediatric patients under 2 years of age. Efficacy in pediatric patients under 10 years of age was extrapolated from clinical trials conducted in pediatric patients greater than 10 years of age and from adults.

8.5 Geriatric Use
No overall difference in safety or effectiveness has been observed between elderly and younger patients.

11 DESCRIPTION
BEPREVE (bepotastine besilate ophthalmic solution) 1.5% is a sterile, topically administered drug for ophthalmic use. Each mL of BEPREVE contains 15 mg bepotastine besilate.
Bepotastine besilate is designated chemically as (+) -4-[[(S)-p-chloro-alpha -2-pyridylbenzyl]oxy]-1-piperidine butyric acid monobenzenesulfonate.
The chemical structure for bepotastine besilate is:



Bepotastine besilate is a white or pale yellowish crystalline powder. The molecular weight of bepotastine besilate is 547.06 daltons. BEPREVE® ophthalmic solution is supplied as a sterile, aqueous 1.5% solution, with a pH of 6.8.
The osmolality of BEPREVE (bepotastine besilate ophthalmic solution) 1.5% is approximately 290 mOsm/kg.
Each mL of BEPREVE® (bepotastine besilate ophthalmic solution) 1.5% contains:
Active: Bepotastine besilate 15 mg (equivalent to 10.7 mg bepotastine)
Preservative: benzalkonium chloride 0.005%
Inactives: monobasic sodium phosphate dihydrate, sodium chloride, sodium hydroxide to adjust pH, and water for injection, USP.

12 CLINICAL PHARMACOLOGY
12.1 Mechanism of Action
Bepotastine is a topically active, direct H_1-receptor antagonist and an inhibitor of the release of histamine from mast cells.

12.3 Pharmacokinetics
Absorption: The extent of systemic exposure to bepotastine following topical ophthalmic administration of bepotastine besilate 1% and 1.5% ophthalmic solutions was evaluated in 12 healthy adults. Following one drop of 1% or 1.5% bepotastine besilate ophthalmic solution to both eyes four times daily (QID) for seven days, bepotastine plasma concentrations peaked at approximately one to two hours post-instillation. Maximum plasma concentration for the 1% and 1.5% strengths were 5.1 ± 2.5 ng/mL and 7.3 ± 1.9 ng/mL, respectively. Plasma concentration at 24 hours post-instillation were below the quantifiable limit (2 ng/mL) in 11/12 subjects in the two dose groups.

Distribution: The extent of protein binding of bepotastine is approximately 55% and independent of bepotastine concentration.

Metabolism: *In vitro* metabolism studies with human liver microsomes demonstrated that bepotastine is minimally metabolized by CYP450 isozymes.

In vitro studies demonstrated that bepotastine besilate does not inhibit the metabolism of various cytochrome P450 substrate via inhibition of CYP3A4, CYP2C9, and CYP2C19. The effect of bepotastine besilate on the metabolism of substrates of CYP1A2, CYP2C8, CYP2D6 was not studied. Bepotastine besilate has a low potential for drug interaction via inhibition of CYP3A4, CYP2C9, and CYP2C19.

Excretion: The main route of elimination of bepotastine besilate is urinary excretion (with approximately 75-90% excreted unchanged in urine).

13 NONCLINICAL TOXICOLOGY
13.1 Carcinogenesis, Mutagenesis and Impairment of Fertility
Long-term dietary studies in mice and rats were conducted to evaluate the carcinogenic potential of bepotastine besilate. Bepotastine besilate did not significantly induce neoplasms in mice receiving a nominal dose of up to 200 mg/kg/day for 21 months or rats receiving a nominal dose of up to 97 mg/kg/day for 24 months. These dose levels represent systemic exposures approximating 350 and 200 times that achieved with human topical ocular use. The no observable adverse effect levels for bepotastine besilate based on nominal dose levels in carcinogenicity tests were 18.7 to 19.9 mg/kg/day in mice and 9.6 to 9.8 mg/kg/day in rats (representing exposure margins of approximately 60 and 20 times the systemic exposure anticipated for topical ocular use in humans).

There was no evidence of genotoxicity in the Ames test, in CHO cells (chromosome aberrations), in mouse hepatocytes (unscheduled DNA synthesis), or in the mouse micronucleus test.

When oral bepotastine was administered to male and female rats at doses up to 1,000 mg/kg/day, there was a slight reduction in fertility index and surviving fetuses. Infertility was not seen in rats given 200 mg/kg/day oral bepotastine besilate (approximately 3,300 times the systemic concentration anticipated for topical ocular use in humans).

14 CLINICAL STUDIES
Clinical efficacy was evaluated in 2 conjunctival allergen challenge (CAC) studies (237 patients). BEPREVE (bepotastine besilate ophthalmic solution) 1.5% was more effective than its vehicle for relieving ocular itching induced by an ocular allergen challenge, both at a CAC 15 minutes post-dosing and a CAC 8 hours post dosing of BEPREVE.

The safety of BEPREVE was evaluated in a randomized clinical study of 861 subjects over a period of 6 weeks.

16 HOW SUPPLIED/STORAGE AND HANDLING
BEPREVE® (bepotastine besilate ophthalmic solution) 1.5% is supplied in a white low density polyethylene plastic squeeze bottle with a white controlled dropper tip and a white polypropylene cap in the following size:
5 mL (NDC 24208-629-02)
10 mL (NDC 24208-629-01)

STORAGE
Store at 15° – 25°C (59° – 77°F).

17 PATIENT COUNSELING INFORMATION
17.1 Topical Ophthalmic Use Only
For topical ophthalmic administration only.

17.2 Sterility of Dropper Tip
Patients should be advised to not touch dropper tip to any surface, as this may contaminate the contents.

17.3 Concomitant Use of Contact Lenses
Patients should be advised not to wear a contact lens if their eye is red. Patients should be advised that BEPREVE should not be used to treat contact lens-related irritation.

Patients should also be advised to remove contact lenses prior to instillation of BEPREVE. The preservative in BEPREVE, benzalkonium chloride, may be absorbed by soft contact lenses. Lenses may be reinserted after 10 minutes following administration of BEPREVE.

Manufactured by: Bausch & Lomb Incorporated
Tampa, FL 33637
Under license from:
Senju Pharmaceutical Co., Ltd.
Osaka, Japan 541-0046

about by Joe Toland and his willingness to teach at the college and run its glaucoma clinic. Also, under his auspices, he would allow you to use an anesthetic to perform Shiotz tonometry. We hadn't gotten the Goldmann tonometer, yet. You could do visual fields, too, but then you would refer to ophthalmology.

What about corneal scratches and foreign bodies? If you couldn't use antibiotics and you couldn't use cycloplegics, could you remove something from the cornea?

No. We were extremely limited.

Did you know Lou Catania, OD?

Lou Catania was a graduate of PCO, also a student of mine. Lou was able to use drugs and diagnostics and developed a tremendous reputation as a one of the first primary care practitioners. He joined PCO under President/Dean Norman Wallace, who brought PCO out of the dark ages. Lou was a dynamic speaker and writer. He also was extremely influential in the movement to move the profession forward.

Also, when Thomas Lewis, OD, was at the college, he and Tony DiStefano, OD, helped bring about PCO's modern clinic, they called it the Eye Institute. They helped bring education all over the world, becoming a member of the World Health Organization. Dr. Lewis became a huge proponent of education. He established a solid endowment, which allowed the school to get advanced instrumentation, and they both helped bring about the change from PCO to Salus, recognizing that optometry could have an interdisciplinary approach with other health care professions.

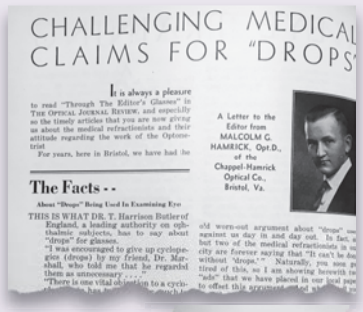
When did the first states begin to get the ability to use diagnostic drugs for regular optometrists, not just the Veterans Administration or Armed Services optometrists?

In the early 1970s. As I remember, at that time, PCO was very active in developing a curriculum, along with many very fine teachers across the states. This is where Dr. Toland became very important, because he lectured and helped set up a CE program. At that time, he was a spokesman for optometry and appeared before many state boards and legislative bodies to influence the passage of diagnostic drug laws. In Pennsylvania—even though we were at the forefront of teaching others—we didn't get the privilege to use diagnostic drugs until much later.

As I recall, Pennsylvania was one of the last in the late 1990s to get therapeutic drugs as well. And I remember, when I started optometry school, in 1985, only 28 states allowed therapeutics and only 48 allowed diagnostics.

DROPPING SOME KNOWLEDGE

In 1934, Dr. Malcolm G. Hamrick wrote to *The Optical Journal and Review* to expound upon the virtues and value of the optometrist's knowledge after being incensed by a newspaper ad (in those days this was referred to as professional business card) promoting optical wear rather than excellence in examination.


CHALLENGING MEDICAL CLAIMS FOR "DROPS"

It is always a pleasure to read "Through The Editor's Glasses" in THE OPTICAL JOURNAL REVIEW, and especially so the timely articles that you are now giving us about the medical refractionists and their attitude regarding the work of the Optometrist

For years, here in Bristol, we have had the

A Letter to the Editor from MALCOLM G. HAMRICK, Opt.D., of the Chappel-Hamrick Optical Co., Bristol, Va.

The Facts - -

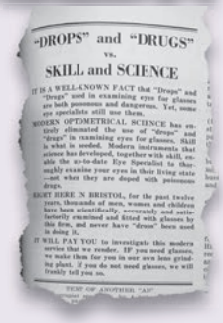
About "Drops" Being Used In Examining Eye

THIS IS WHAT DR. T. Harrison Butler of England, a leading authority on ophthalmic subjects, has to say about "drops" for glasses.

"I was encouraged to give up cycloplegics (drops) by my friend, Dr. Marshall, who told me that he regarded them as unnecessary . . . .

"There is one vital objection to a cyclo-

old worn-out argument about "drops" against us day in and day out. In fact, but two of the medical refractionists in city are forever saying that "It can't be without "drops." " Naturally, you soon tired of this, so I am showing herewith "ads" that we have placed in our local to offset this


"DROPS" and "DRUGS" vs. SKILL and SCIENCE

IT IS A WELL-KNOWN FACT that "Drops" and "Drugs" used in examining eyes for glasses are both poisonous and dangerous. Yet, some eye specialists still use them.

MODERN OPTOMETRICAL SCIENCE has entirely eliminated the use of "drops" and "drugs" in examining eyes for glasses. Skill is what is needed. Modern instruments that science has developed, together with skill, enable the up-to-date Eye Specialist to thoroughly examine your eyes in their living state —not when they are doped with poisonous drugs.

SEE HERE IN BRISTOL, for the past twelve years, thousands of men, women and children have been scientifically —accurately and satisfactorily examined and fitted with glasses by this firm, and never have "drops" been used in doing it.

IT WILL PAY YOU to investigate this modern service that we render. IF you need glasses, we make them for you in our own lens grinding plant. If you do not need glasses, we will frankly tell you so.

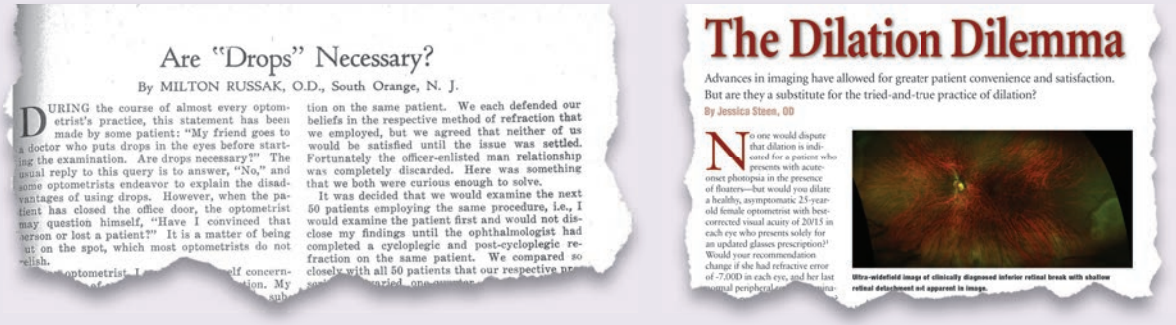
SEE OF ANOTHER "AD"

In 2016, as third-party payers have become the dominant force in examination fee/procedure reimbursement, the issue remains relevant. Government (Medicare and Medicaid) and private insurance companies continue to lower professional fee reimbursements annually as they attempt to trim fat from the bone. With fixed costs such as rent, utilities, phone, personnel, infrastructure and electronic medical records rising each year, practitioners are faced with three options to make up the shortfall: compete in the retail market for optical and non-optical devices (spectacles, low vision devices), see more patients or move into an inelastic specialty market by obtaining expert knowledge in a particular discipline, such as contact lenses, pediatrics/binocular vision, dry eye disease or sport/performance vision. As Dr. Hamrick realized in 1934, the value of having an optical dispensary cannot be denied. While the average third-party eye examination reimbursement today is less than $70, the average income seen on the sale of an optical device is far more profitable. Although the economic forces favor a culture that Dr. Hamrick recognized might limit the profession, I think we agree with his premise: it is clinical competence that permits all diseases—refractive, biologic and developmental—to be properly diagnosed and managed.

Hamrick MG. Challenging medical claims for drops. Optical Journal-Review. 1934;61(23):16-7.

What did the public think of the optometrist back in 1966, then midway in 1978, as compared to what the public thinks now?

I had the feeling the patients trusted me with their eyes and expected me to look after their vision and refer them if circumstances required additional care, such as treatment for glaucoma or referral for cataract removal. Remember, in those early days, there were no



Are "Drops" Necessary?

By MILTON RUSSAK, O.D., South Orange, N. J.

DURING the course of almost every optometrist's practice, this statement has been made by some patient: "My friend goes to a doctor who puts drops in the eyes before starting the examination. Are drops necessary?" The usual reply to this query is to answer, "No," and some optometrists endeavor to explain the disadvantages of using drops. However, when the patient has closed the office door, the optometrist may question himself, "Have I convinced that person or lost a patient?" It is a matter of being put on the spot, which most optometrists do not relish.

tion on the same patient. We each defended our beliefs in the respective method of refraction that we employed, but we agreed that neither of us would be satisfied until the issue was settled. Fortunately the officer-enlisted man relationship was completely discarded. Here was something that we both were curious enough to solve.

It was decided that we would examine the next 50 patients employing the same procedure, i.e., I would examine the patient first and would not disclose my findings until the ophthalmologist had completed a cycloplegic and post-cycloplegic refraction on the same patient. We compared so closely with all 50 patients that our respective

The Dilation Dilemma

Advances in imaging have allowed for greater patient convenience and satisfaction. But are they a substitute for the tried-and-true practice of dilation?

By Jessica Steen, OD

No one would dispute that dilation is indicated for a patient who presents with acute-onset photopsia in the presence of floaters—but would you dilate a healthy, asymptomatic 25-year-old female optometrist with best-corrected visual acuity of 20/15 in each eye who presents solely for an updated glasses prescription?[1] Would your recommendation change if she had refractive error of -7.00D in each eye, and her last

Ultra-widefield image of clinically diagnosed inferior retinal break with shallow retinal detachment not apparent in image.

Fundamental questions about the use of cycloplegic refraction would appear frequently in *Review of Optometry*, as mentioned below (in 1934 and 1960) and demonstrated above (1946 and 2016). Though the reasoning and technology would evolve over the years, optometry's inquisitive nature would remain.

HISTORY REPEATING ITSELF

In 1934 and again in 1960 the concept of cycloplegic refraction was challenged in *The Optical Journal-Review*.[1,2] Proponents recognized that cycloplegic refraction increased the accuracy of refraction while helping to eliminate patient subjectivity. Other advantages included uncovering "esophoric squint" brought on by high hyperopia; increased ability to discover pseudo myopia and other disorders of accommodation, which created false or variable refraction; and eliminate the unreliability seen in younger patients. Opponents argued that drops were unwelcomed by patients who would have to endure a "long period of blurred vision." The drops sometimes created unwanted side effects and cycloplegic refraction was, as a rule, no more accurate than refraction without them.

Today, we know that in ordinary circumstances cycloplegic refraction is not mandatory and yields no better refractive data than the dry. However, cycloplegic refraction is used to:

(1) measure absolute refractive error before refractive surgery
(2) rule out latent hyperopia and maximize prescribed plus in accommodative esotropes
(3) relax patients' convergence in cases of spasm of the near reflex
(4) dispense a significant new hyperopic prescription (spectacles or contact lenses) using the tapered technique termed "cyclo-therapy"
(5) obtain reliable data where unreliable data had been obtained in the past

The reply by Dr. Herschel Russell applies today: "When used intelligently and with a knowledge of the whys and wherefores, cycloplegics can be of a tremendous advantage to the capable refractionist."[2]

1. Hamrick MG. Challenging medical claims for drops. Optical Journal-Review. 1934;61(23):16-7.
2. Russell H. The use of drugs in refraction. Optical Journal-Review. 1960;97(13):31-2.

implanted lenses. Lenses were dissolved and taken out and consequently that's when optometry really started to come into its own because, by that time, soft contact lenses were becoming available which helped the aphakic patient see without thick spectacles.

When did you first learn of soft contact lenses and how did you learn to fit them?

Well, I recall Bob Morrison, OD, from Harrisburg, Pa., was a respected optometrist and noted engineer in contact lens development and polymethyl methacrylate lenses. He was the first, I think, to bring over a Czechoslovakian lens material. He showed it to us and, of course, we were absolutely amazed. Of course, there were some vision problems with it and some fitting problems, but really the big breakthrough in soft lenses came when Bausch + Lomb developed their set of soft lenses with a fitting set and a sterilization method which, in those days, was saline with a small steamer (heat) type of unit. We went to CE programs set up by Bausch + Lomb at the college and other areas and we learned how to fit them.

Who in those days was laying the groundwork so that your practice could push forward?

Well, certainly organized optometry was very important. They were pushing for legislation, but basically it was the schools and associations of optometry and, I have to say, in my own mind: PCO was at the forefront of pushing for those types of legislation. As a matter of fact, A. Norman Haffner, OD—who was a pioneer—established a school up in New York and students from there were getting training at PCO, believe it or not!

What do you consider the greatest diagnostic advance that has helped you diagnose and manage disease? I would answer the OCT is the greatest advance

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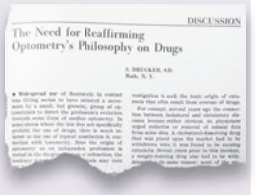

DISCUSSION

The Need for Reaffirming Optometry's Philosophy on Drugs

S. DRUCKER, O.D.
Bath, N. Y.

Between 1968 and 1974, optometry began its renaissance, but not without some dissention. In 1968, Dr. S. Drucker's impassioned *Optical Journal-Review* letter asks the profession to embrace its place in the medical science field as a "contributor to the store of knowledge in diagnosis and treatment by drugless methods" almost as if to say, 'be proud of who you are and stop wanting to be something you're not!' Yet others pushed forward, advocating for a more active and curative profession.

Drucker S. The need for reaffirming optometry's philosophy on drugs. Optical Journal-Review. 1968;105(19):35-6.

that we've ever seen. I would have to say the binocular indirect ophthalmoscope would have to be up there. The Goldmann tonometer would be up there, too.

For me it was the 90D lens. I think OCT is also important in my mind, because it can bring into view the anatomic correlation of diseases of the optic nerve and retina … and now diseases under the retina. You can also get a printout that you can share.

What about early fundus photography?

Certainly, that was a big help. The early cameras were expensive and clunky. They also used film. You might have to wait an entire month before you sent a roll to be developed. And if you didn't keep good records when you shot the photos, you might not remember what or whom the picture was of. Many of us felt you didn't have to go to that expense if you kept good records and you were able to use the 90D lens and the indirect ophthalmoscope to find and then draw (with colored pencils) what you saw. Today, the modern day slit lamp and its auxiliary lenses really permit good views; all of these tools help in the diagnosis of things like hypertension-related issues like vein occlusion, emboli, artery occlusion and diabetic retinopathy.

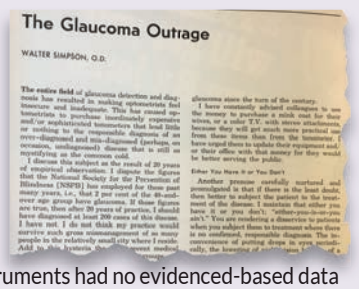
You couldn't do a contact three mirror or gonio evaluation, because you couldn't numb the eye to get a get a gonio prism on it.

Actually, at PCO, we did develop a sneaky way to do gonio, by putting a soft lens on the eye first and then putting the gonio on the soft lens.

What can optometry do to improve diagnostic capabilities in the future?

I just think, for optometry to better succeed and have a better footing with the public and the medical profession, we need to keep current. We need to fight harder than the average bear. We're a young profession—we've really only been around for 60 or 70 years, and since the 1980s, these last 30 years, we're just coming into our own with diagnostics and pharmaceuticals. Our teaching, certainly, is bringing more non-ODs into the teaching realm where, before, one of the criticisms was that we only had ODs teaching ODs. Now, we have people in PhD roles, MDs, retina and

MAN VS. MACHINE


The Glaucoma Outrage

WALTER SIMPSON, O.D.

In 1974, Walter Simpson, OD, wrote, "The entire field of glaucoma detection and diagnosis is making optometrists feel insecure and inadequate." It must have been a cause of frustration for him to watch the tonometry revolution unfold along with the common introduction of techniques such as gonioscopy and tonography, and know these techniques could not be used by those in the "drugless" profession. As a measure of defense, he asked his colleagues, "is glaucoma not still the sum of optic disc changes with corresponding visual field changes? Is this not what ophthalmology has been professing for the last 20 years?" In this case, since the optometrist can use an ophthalmoscope to observe the optic disc and perimetry to measure the visual field, why would an optometrist be inadequate? He concluded, by evidence of his readings and by lectures he attended given by ophthalmologists, that these new "expensive" instruments had no evidenced-based data that supported their use over the conventional methods used to diagnose the disease (disc appearance and visual fields). In 2016, we understand there are multiple mechanisms and risk factors related to the formation of glaucoma, one of which is intraocular pressure. We got there through careful scrutiny of each of the disease's parameters via evidence-based data where numerous elements of the eye and central nervous system have been evaluated by new "expensive" instruments (optical coherence tomography, pachymetry, histerometry, focal electroretinography, new tonometers). The goal has always been to understand the pathophysiology of the disease process, unlocking the first signs of conversion to the treatable form. Through the years, as the data came in, I'm sure Dr. Simpson recognized the benefits of the "new expensive instruments;" however, his big picture message is to question everything and verify with evidence-based data. Good advice.

Simpson W. The glaucoma outrage. Optical Journal-Review. 1974;111(7):20-1.


HOW TO PERFORM AND INTERPRET
FLUORESCEIN AN
LARRY J. ALEXANDER, O.D.
BIRMINGHAM, ALA.

STANDING THE TEST OF TIME

In 1988, the great Larry Alexander, OD, wrote an article in *Review of Optometry* on the merits of understanding, performing and interpreting sodium fluorescein angiography. The article predated his now famous textbook *Primary Care of The Posterior Segment*. It was succinct, accurate and contained photographs with schematic diagrams which crystalized the concepts of the paper. "Primary Care of The Posterior Segment" was the quintessential optometric retinal reference. It had both color and black and white photographs along with magnificent schematic illustrations, which clearly depicted the pathophysiology of each entity. It was well written, easy to understand and well referenced. The paper he wrote in 1988 is timeless; it still holds water and remains an accurate reference in 2016. Gosh, I miss him.

Alexander L. How to perform and interpret fluorescein angiography. Review of Optometry. 1988;125(1):71-82.

glaucoma specialists. We're coming into our own.

I think we always need to be on the cutting edge with continuing education. It's a good thing that we came up with CE and mandatory number of hours per two years in Pennsylvania and other states to keep our brethren current in the field. And then put those things to use! We've got to put it to use. My concern is, we teach students to be very fine practitioners and they walk out and go into situations where they're not using the full scope of their knowledge.

My dream would be to see optometry to go the way of dentistry and podiatry. Dentists now have a "DMD" degree. Podiatrists have a "DPM." Even veterinarians have "VMD." I would like to see the birth of the "OMD," optometric medical doctor. We might have to partner with medicine and dovetail our curriculum and residencies with theirs, but this would permit us to get the residency training nationwide to practice at the level we're taught in our schools. It'd go a long way to better serving the public. ■

CONTACT LENSES: A PERFECT FIT FOR OPTOMETRY

Though its origins may stem from ophthalmology, the contact lens was mastered and perfected in the hands of optometrists.

BY ALIZA BECKER, SENIOR ASSOCIATE EDITOR

The refracting opticians of 1891—just then embarking on the journey to found the optometric profession—were likely unaware that, three years prior, another revolution had begun, one that would intertwine with their own decades later. While those early optical specialists were busy refining the art and science of spectacle lens prescribing in the United States, German ophthalmologist Adolf Fick had demonstrated a new method of refractive error correction: "contact glasses," as he dubbed the modality we now call contact lenses.[1]

Making glass-blown lenses, some as large as 21mm in diameter, Fick put into practice a concept theorized by Leonardo da Vinci nearly four centuries earlier. Fick made plaster casts of cadaver eyes and fashioned scleral-fit contact lenses for keratoconic patients who couldn't be corrected with spectacles. "In these circumstances, it is certainly not superfluous to look for another means for correction of various types of irregular astigmatism," Fick wrote in an 1888 paper. "The most radical means would seem to replace the cornea with another regularly curved surface."[1] This he did—with limited success. His lenses were too large and heavy for practical use, and they offered no means of oxygen transmission.

Fick's work was essentially what we might call a proof-of-concept study today, not a commercially viable design. Attempts at producing a working contact lens for the general public began with Fick's German compatriot August Müller, who created glass lenses to correct his own -14D myopia. Soon after, the Carl Zeiss company began to produce the first commercially available contact lens trial sets and glass lenses in 1912.[2] Other medical victories, including the development of anesthesia in 1884 and fluorescein in 1871, made the process of fitting lenses on patients easier, while technology such as the keratometer and lathes for the manufacturing of lenses continued to advance.[2-4]

However, limitations resulting from the use of glass—discomfort, irritation, swelling, poor adherence—remained.[3] Also, glass contact lenses were considered dangerous to wear, further hindering adoption for simple vision correction.[5] What might be better? "Next to plastic glass, or a jelly-like refractive substance that would be practical for optical purposes, might come a material that would be the equal of our own present glass, only more durable or less liable to crack or shatter. Lenses could then be made thinner, lighter in weight and more inconspicuous than those we now use," noted a speculative but prescient 1897 paper on theoretical and applied optics.[6]

That wish would begin to come true by the 1930s as manufacturers turned to plastic materials, producing contact lenses that were thinner and easier to wear than their glass predecessors.[7] Optometrist William Feinbloom, credited with the first use of a non-glass material, created a lens with a plastic resin outer segment and a glass optical center.[5] Soon after, Teo Obrig and Ernest Mullen, among others pioneered the use of polymethyl methacrylate (PMMA)—the material used in Plexiglas—for contact lenses.[2,8]

With these advancements, optometrists started to embrace contact lens fitting as a viable option, and a rather futuristic one at that. Ads that ran in this magazine enticed Depression-era readers with the promise that contact lenses are "as modern as the world of tomorrow" *(Figure 1)*.

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Fig. 1. In the 1930s, contact lenses were advertised as a gee-whiz replacement for glasses. However, complications were common and fitting more complex.

Articles began to appear in *The Optical Journal and Review of Optometry* to help readers build up their knowledge base. Even then, patient compliance was paramount for success. "To the skilled practitioner there is little difficulty in fitting contact lenses, if he can secure the intelligent cooperation of the patient," wrote an author in one of *Review*'s 1937 contact lens articles. "Three factors are of prime importance: the accuracy of fit, the ease with which tolerance can be established, and the physical and mental condition of the wearer." All still ring true nearly 80 years later.

Dr. Feinbloom himself wrote for this publication in 1941 on the topic of correcting hyperopia with contact lenses. All throughout the evolution of contact lenses, other pioneers would share their theories and practical insights in these pages as well, including a notable early discussion of dry eye and contact lenses from 1960 that described the value of a brand new clinical tool: the Schirmer strip *(Figure 2)*.

MAKING STRIDES

PMMA contact lenses improved upon glass, to be sure, but still lacked oxygen transmission, and the "hard" lenses caused much discomfort.

The first rigid gas permeable (RGP) lenses didn't arrive until 1969, comprised of cellulose acetate butyrate, methacrylate-silicone combinations or simply pure silicone.[3,7] These materials helped combat the oxygen deprivation that contributed to edema in PMMA wearers while still providing the clear, stable vision of rigid lenses.[7] The corneal GP was invented when Kevin Tuohy accidentally cut down the size of a scleral lens during manufacturing and liked the ensuing size.[5]

In a separate undertaking, invention of a "water swellable gel" by Otto Wichterle and Drahoslav Lim in Prague in the late 1950s gave rise to the modern soft contact lens.[2,9] The material, polyhydroxyethyl methacrylate (HEMA), was first designed for artificial mandible construction, but ultimately was repurposed by Wichterle when he found it could also be spin-cast into a contact lens.[10]

The first breakthrough occurred in 1971 when Bausch + Lomb launched the SofLens in the United States, using patents held by the National Patent Development Corp. that were granted to them by Wichterle.[3,11] And with that, the modern contact lens industry was born.

For a time, complications from and negative attitudes towards these new lenses abounded: *Review* published several articles in the mid-1970s on the subject. In "Why Patients and Doctors Resist Soft Lenses—The Four 'Uns'," influential contact lens expert Robert Koetting, OD, discussed why practitioners and patients were slow to adopt the new modality. "The doctor is uncertain. He wonders if he can fit the new lenses successfully and he wonders if they are here to stay. The patient wonders, too. The patient wonders if he can really wear the lenses and whether those scare stories he read are really true."

Other problems our authors tackled in these pages included high-riding lenses, mucous build-up, lens coating ("The Most Serious Soft Lens Problem," as Dr. Koetting called it) and numerous technical issues in fitting and design.[12,13] Also, articles on orthokeratology and anisometropia gave doctors information on how to better handle patients with specialty needs.[14,15]

These were the formative years of the soft lens industry, and optometrists were instrumental in helping to realize its potential. Some, like Dr. Koetting, were among the first to develop specialty contact lens practices devoted to mastering this new and still largely unproven modality. Others, like Newton Wesley, OD, and George Jessen, OD, concentrated on research and development that went on to power the next wave of product innovation. The company they founded made key strides in specialty contact lens development. They may have been almost as significant as educators, however. "Wesley and Jessen taught all of us how to fit contact lenses," said early contact lens proponent and educator Frank D. Fontana, OD, in a 2009 retrospective.[5] "They almost single-handedly developed the market for contact lenses, just by traveling around the country educating people."

Many other optometrists of the day played pivotal roles. A list of contact lens pioneers at the dawn of the soft lens era reads like a "Who's Who" of mid-1970s optometry: in addition to Drs. Koetting, Fontana, Wesley and Jessen, notable thought leaders included optometrists Rex Ghormley, Neal Bailey, Don Korb, Paul Farkas, Ted Kassalow, Robert Morrison, Harold Davis, Mel Remba, Seymour Marco, Robert Kennedy, Jack Solomon, Rodger Kame, Robert Graham, Morton Sarver, Leonard Seidner, Wayne Cannon, Robert Mandel, Maurice Poster, David Ewell, Edward Goodlaw, Ted Bayshore and many others.[5]


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These are the people who built the institutions and infrastructure of the contact lens field—and they had an "OD" after their names.

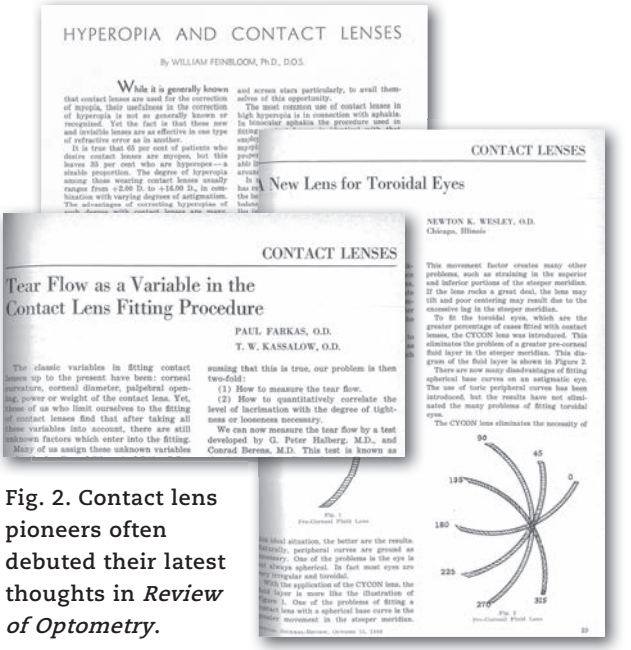
Throughout the 1970s and 1980s, optometrists led the way in developing new and better protocols of clinical care. Many were involved in research studies too—a rarity for optometry. Drs. Farkas and Kassalow in particular were instrumental in bringing to market extended wear soft lenses and several new GPs.

In perhaps the crowning achievement of the decade, in 1976 Brien Holden established the Cornea and Contact Lens Research Unit at the University of New South Wales, an institution that quickly became a hotbed of research—with optometrists in lead positions—and remains so today. Optometry has "owned" contact lens research ever since.

GROWING PAINS

Despite optometric enthusiasm for contact lenses in the 1970s, the public was more dubious. An article in our June 1973 issue noted that of the 191,602 respondents to a 1971 US health survey, only 3,972 participants reported contact lens wear, while 92,716 continued to wear glasses.[16] A second survey conducted by *Seventeen* magazine found that even by 1975, only one out of every four women needing corrective lenses ages 13 to 19 opted for contact lenses.[17]

Optometrists had plenty of challenges to work through if they wanted to broaden the appeal of contact lenses. "There are fewer problems with corneal insult and adaptation" with soft lenses, wrote one panelist in a July 1975 reader survey on prescribing habits. Another added there was "less irritation to patients and fewer problems for me with these lenses."[18] But others were more wary of soft lenses as an alternative to tried-and-true rigid lenses, with over half of respondents to the report noting they continued to fit first-time patients in RGPs in part for their higher visual clarity and ability to accommodate more ocular issues.[16] One panelist from


HYPEROPIA AND CONTACT LENSES

By WILLIAM FEINBLOOM, Ph.D., D.O.S.

While it is generally known that contact lenses are used for the correction of myopia, their usefulness in the correction of hyperopia is not so generally known or recognized. Yet the fact is that these new and invisible lenses are as effective in one type of refractive error as in another.

It is true that 65 per cent of patients who desire contact lenses are myopes, but this leaves 35 per cent who are hyperopes—a sizable proportion. The degree of hyperopia among those wearing contact lenses usually ranges from +2.00 D. to +16.00 D., in combination with varying degrees of astigmatism. The advantages of correcting hyperopias of

CONTACT LENSES

New Lens for Toroidal Eyes

NEWTON K. WESLEY, O.D.
Chicago, Illinois

This movement factor creates many other problems, such as straining in the superior and inferior portions of the steeper meridian. If the lens rocks a great deal, the lens may tilt and poor centering may result due to the excessive lag in the steeper meridian.

To fit the toroidal eyes, which are the greater percentage of cases fitted with contact lenses, the CYCON lens was introduced. This eliminates the problem of a greater pre-corneal fluid layer in the steeper meridian. This diagram of the fluid layer is shown in Figure 2.

There are now many disadvantages of fitting spherical base curves on an astigmatic eye. The use of toric peripheral curves has been introduced, but the results have not eliminated the many problems of fitting toroidal eyes.

The CYCON lens eliminates the necessity of

90 45 135 0 180 225 270 315

CONTACT LENSES

Tear Flow as a Variable in the Contact Lens Fitting Procedure

PAUL FARKAS, O.D.
T. W. KASSALOW, O.D.

The classic variables in fitting contact lenses up to the present have been: corneal curvature, corneal diameter, palpebral opening, power or weight of the contact lens. Yet, those of us who limit ourselves to the fitting of contact lenses find that after taking all these variables into account, there are still unknown factors which enter into the fitting. Many of us assign these unknown variables

suming that this is true, our problem is then two-fold:

(1) How to measure the tear flow.

(2) How to quantitatively correlate the level of lacrimation with the degree of tightness or looseness necessary.

We can now measure the tear flow by a test developed by G. Peter Halberg, M.D., and Conrad Berens, M.D. This test is known as

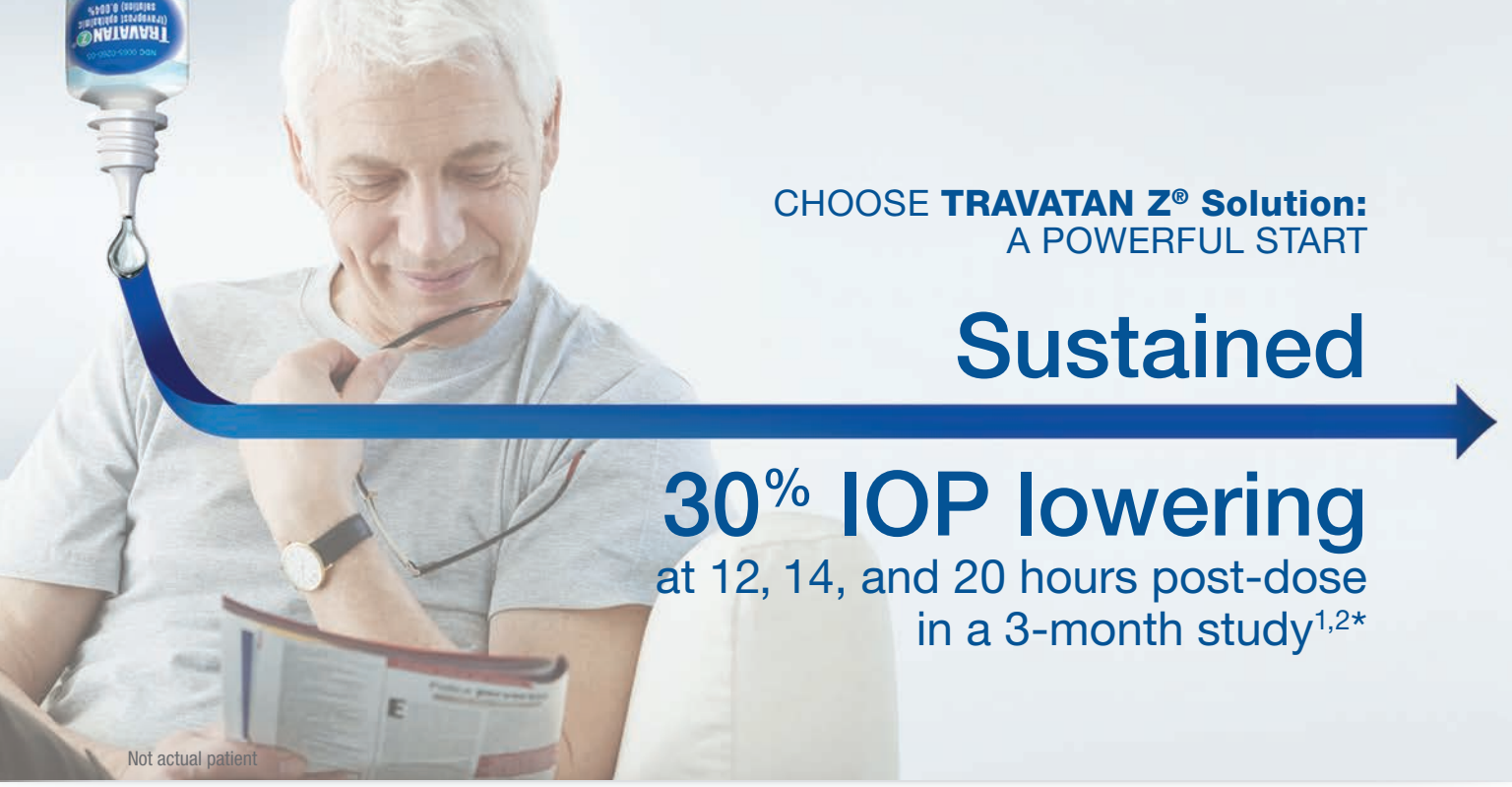
Fig. 2. Contact lens pioneers often debuted their latest thoughts in *Review of Optometry*.

the same report called the development of the soft lens "merely a step in the right direction, and only a small step at that. Improvements are sorely needed in the areas of optics, manufacturing, measurability, hygiene, maintenance, public information and governmental control."[18]

The latter topic was a contentious one. Government efforts to regulate the contact lens industry placed further stress on growth; a November 1975 report titled "Outlook for the Contact Lens Industry" noted the FDA's recent release of regulations designating non-PMMA contact lenses as drugs requiring premarket clearance and investigation into whether material components of PMMA lenses should be similarly controlled. "What concerns our industry now," then-president of the Contact Lens Manufacturing Association Charles W. Neefe said, "is why we should be required to prove that which has been proven so conclusively over so many years."[19] Questions about whether insurers would cover

FIRST CONTACT: AN ANNUAL TRADITION DEBUTS

In 1977, this magazine launched an annual contact lens issue to recognize the importance of the modality and address the challenges of the day. Next month will see its 40th installment. Back in '77, ODs wanted to hear about overnight rigid lens wear and orthokeratology; problems and complications, including the effects of soft lens flexure on lens power, micro dry spots on the cornea and lens wear intolerance due to allergies; the aspheric lens fitting process; contact lens practice management; and the prescription of eyeglasses for contact lens wearers. "Nearly four decades have passed since the AOA formally recognized contact lens fitting as an integral part of the optometric practice," a contact lens panel article stated in April 1977. "That was in 1938. Even then, the interest of optometrists in this particular area of practice was intense. The fervor among practitioners to learn more about contact lenses was such that courses in fitting were being readily accredited by the AOA, despite the fact that contact lenses were still limited to experimental use. Much has changed [since then.] But the interest in contact lens practice has not diminished."[21]



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INDICATIONS AND USAGE

TRAVATAN Z® (travoprost ophthalmic solution) 0.004% is indicated for the reduction of elevated intraocular pressure (IOP) in patients with open-angle glaucoma or ocular hypertension.

Dosage and Administration

The recommended dosage is 1 drop in the affected eye(s) once daily in the evening. TRAVATAN Z® Solution should not be administered more than once daily since it has been shown that more frequent administration of prostaglandin analogs may decrease the IOP-lowering effect.

TRAVATAN Z® Solution may be used concomitantly with other topical ophthalmic drug products to lower IOP. If more than 1 topical ophthalmic drug is being used, the drugs should be administered at least 5 minutes apart.

IMPORTANT SAFETY INFORMATION

Warnings and Precautions

Pigmentation—Travoprost ophthalmic solution has been reported to increase the pigmentation of the iris, periorbital tissue (eyelid), and eyelashes. Pigmentation is expected to increase as long as travoprost is administered. After discontinuation of travoprost, pigmentation of the iris is likely to be permanent, while pigmentation of the periorbital tissue and eyelash changes have been reported to be reversible in some patients. The long-term effects of increased pigmentation are not known. While treatment with TRAVATAN Z® Solution can be continued in patients who develop noticeably increased iris pigmentation, these patients should be examined regularly.

Eyelash Changes—TRAVATAN Z® Solution may gradually change eyelashes and vellus hair in the treated eye. These changes include increased length, thickness, and number of lashes. Eyelash changes are usually reversible upon discontinuation of treatment.

Use With Contact Lenses—Contact lenses should be removed prior to instillation of TRAVATAN Z® Solution and may be reinserted 15 minutes following its administration.

Adverse Reactions

The most common adverse reaction observed in controlled clinical studies with TRAVATAN Z® Solution was ocular hyperemia, which was reported in 30 to 50% of patients. Up to 3% of patients discontinued therapy due to conjunctival hyperemia. Ocular adverse reactions reported at an incidence of 5 to 10% in these clinical studies included decreased visual acuity, eye discomfort, foreign body sensation, pain, and pruritus. In postmarketing use with prostaglandin analogs, periorbital and lid changes including deepening of the eyelid sulcus have been observed.

Use in Specific Populations

Use in pediatric patients below the age of 16 years is not recommended because of potential safety concerns related to increased pigmentation following long-term chronic use.

For additional information about TRAVATAN Z® Solution, please see the brief summary of Prescribing Information on the adjacent page.

*Study Design: Double-masked, randomized, parallel-group, multicenter non-inferiority comparison of the efficacy and safety of travoprost 0.004% preserved with benzalkonium chloride (BAK) to TRAVATAN Z® Solution after 3 months of treatment in patients with open-angle glaucoma or ocular hypertension. Baseline IOPs were 27.0 mm Hg (n=322), 25.5 mm Hg (n=322), and 24.8 mm Hg (n=322) at 8 AM, 10 AM, and 4 PM for TRAVATAN Z® Solution. At the end of Month 3, the TRAVATAN Z® Solution group had mean IOPs (95% CI) of 18.7 mm Hg (-0.4, 0.5), 17.7 mm Hg (-0.4, 0.6), and 17.4 mm Hg (-0.2, 0.8) at 8 AM, 10 AM, and 4 PM, respectively. Statistical equivalent reductions in IOP (95% confidence interval about the treatment differences were entirely within ±1.5 mm Hg) were demonstrated between the treatments at all study visits during the 3 months of treatment.

References: 1. Data on file, 2013. **2.** Lewis RA, Katz GJ, Weiss MJ, et al. Travoprost 0.004% with and without benzalkonium chloride: a comparison of safety and efficacy. *J Glaucoma.* 2007;16(1):98-103.

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(travoprost ophthalmic solution) 0.004%

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BRIEF SUMMARY OF PRESCRIBING INFORMATION

INDICATIONS AND USAGE
TRAVATAN Z® (travoprost ophthalmic solution) 0.004% is indicated for the reduction of elevated intraocular pressure in patients with open-angle glaucoma or ocular hypertension.

DOSAGE AND ADMINISTRATION
The recommended dosage is one drop in the affected eye(s) once daily in the evening.
TRAVATAN Z® (travoprost ophthalmic solution) should not be administered more than once daily since it has been shown that more frequent administration of prostaglandin analogs may decrease the intraocular pressure lowering effect.

Reduction of the intraocular pressure starts approximately 2 hours after the first administration with maximum effect reached after 12 hours.

TRAVATAN Z® Solution may be used concomitantly with other topical ophthalmic drug products to lower intraocular pressure. If more than one topical ophthalmic drug is being used, the drugs should be administered at least five (5) minutes apart.

CONTRAINDICATIONS
None

WARNINGS AND PRECAUTIONS
Pigmentation
Travoprost ophthalmic solution has been reported to cause changes to pigmented tissues. The most frequently reported changes have been increased pigmentation of the iris, periorbital tissue (eyelid) and eyelashes. Pigmentation is expected to increase as long as travoprost is administered. The pigmentation change is due to increased melanin content in the melanocytes rather than to an increase in the number of melanocytes. After discontinuation of travoprost, pigmentation of the iris is likely to be permanent, while pigmentation of the periorbital tissue and eyelash changes have been reported to be reversible in some patients. Patients who receive treatment should be informed of the possibility of increased pigmentation. The long term effects of increased pigmentation are not known.

Iris color change may not be noticeable for several months to years. Typically, the brown pigmentation around the pupil spreads concentrically towards the periphery of the iris and the entire iris or parts of the iris become more brownish. Neither nevi nor freckles of the iris appear to be affected by treatment. While treatment with TRAVATAN Z® (travoprost ophthalmic solution) 0.004% can be continued in patients who develop noticeably increased iris pigmentation, these patients should be examined regularly.

Eyelash Changes
TRAVATAN Z® Solution may gradually change eyelashes and vellus hair in the treated eye. These changes include increased length, thickness, and number of lashes. Eyelash changes are usually reversible upon discontinuation of treatment.

Intraocular Inflammation
TRAVATAN Z® Solution should be used with caution in patients with active intraocular inflammation (e.g., uveitis) because the inflammation may be exacerbated.

Macular Edema
Macular edema, including cystoid macular edema, has been reported during treatment with travoprost ophthalmic solution. TRAVATAN Z® Solution should be used with caution in aphakic patients, in pseudophakic patients with a torn posterior lens capsule, or in patients with known risk factors for macular edema.

Angle-closure, Inflammatory or Neovascular Glaucoma
TRAVATAN Z® Solution has not been evaluated for the treatment of angle-closure, inflammatory or neovascular glaucoma.

Bacterial Keratitis
There have been reports of bacterial keratitis associated with the use of multiple-dose containers of topical ophthalmic products. These containers had been inadvertently contaminated by patients who, in most cases, had a concurrent corneal disease or a disruption of the ocular epithelial surface.

Use with Contact Lenses
Contact lenses should be removed prior to instillation of TRAVATAN Z® Solution and may be reinserted 15 minutes following its administration.

ADVERSE REACTIONS
Clinical Studies Experience
Because clinical studies are conducted under widely varying conditions, adverse reaction rates observed in the clinical studies of a drug cannot be directly compared to rates in the clinical studies of another drug and may not reflect the rates observed in practice. The most common adverse reaction observed in controlled clinical studies with TRAVATAN® (travoprost ophthalmic solution) 0.004% and TRAVATAN Z® (travoprost ophthalmic solution) 0.004% was ocular hyperemia which was reported in 30 to 50% of patients. Up to 3% of patients discontinued therapy due to conjunctival hyperemia. Ocular adverse reactions reported at an incidence of 5 to 10% in these clinical studies included decreased visual acuity, eye discomfort, foreign body sensation, pain and pruritus. Ocular adverse reactions reported at an incidence of 1 to 4% in clinical studies with TRAVATAN® or TRAVATAN Z® Solutions included abnormal vision, blepharitis, blurred vision, cataract, conjunctivitis, corneal staining, dry eye, iris discoloration, keratitis, lid margin crusting, ocular inflammation, photophobia, subconjunctival hemorrhage and tearing.

Nonocular adverse reactions reported at an incidence of 1 to 5% in these clinical studies were allergy, angina pectoris, anxiety, arthritis, back pain, bradycardia, bronchitis, chest pain, cold/flu syndrome, depression, dyspepsia, gastrointestinal disorder, headache, hypercholesterolemia, hypertension, hypotension, infection, pain, prostate disorder, sinusitis, urinary incontinence and urinary tract infections.

In postmarketing use with prostaglandin analogs, periorbital and lid changes including deepening of the eyelid sulcus have been observed.

USE IN SPECIFIC POPULATIONS
Pregnancy
Pregnancy Category C
Teratogenic effects: Travoprost was teratogenic in rats, at an intravenous (IV) dose up to 10 mcg/kg/day (250 times the maximal recommended human ocular dose (MRHOD), evidenced by an increase in the incidence of skeletal malformations as well as external and visceral malformations, such as fused sternebrae, domed head and hydrocephaly. Travoprost was not teratogenic in rats at IV doses up to 3 mcg/kg/day (75 times the MRHOD), or in mice at subcutaneous doses up to 1 mcg/kg/day (25 times the MRHOD). Travoprost produced an increase in post-implantation losses and a decrease in fetal viability in rats at IV doses > 3 mcg/kg/day (75 times the MRHOD) and in mice at subcutaneous doses > 0.3 mcg/kg/day (7.5 times the MRHOD).

In the offspring of female rats that received travoprost subcutaneously from Day 7 of pregnancy to lactation Day 21 at doses of ≥ 0.12 mcg/kg/day (3 times the MRHOD), the incidence of postnatal mortality was increased, and neonatal body weight gain was decreased. Neonatal development was also affected, evidenced by delayed eye opening, pinna detachment and preputial separation, and by decreased motor activity.

There are no adequate and well-controlled studies of TRAVATAN Z® (travoprost ophthalmic solution) 0.004% administration in pregnant women. Because animal reproductive studies are not always predictive of human response, TRAVATAN Z® Solution should be administered during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Nursing Mothers
A study in lactating rats demonstrated that radiolabeled travoprost and/or its metabolites were excreted in milk. It is not known whether this drug or its metabolites are excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when TRAVATAN Z® Solution is administered to a nursing woman.

Pediatric Use
Use in pediatric patients below the age of 16 years is not recommended because of potential safety concerns related to increased pigmentation following long-term chronic use.

Geriatric Use
No overall clinical differences in safety or effectiveness have been observed between elderly and other adult patients.

Hepatic and Renal Impairment
Travoprost ophthalmic solution 0.004% has been studied in patients with hepatic impairment and also in patients with renal impairment. No clinically relevant changes in hematology, blood chemistry, or urinalysis laboratory data were observed in these patients.

NONCLINICAL TOXICOLOGY
Carcinogenesis, Mutagenesis, Impairment of Fertility
Two-year carcinogenicity studies in mice and rats at subcutaneous doses of 10, 30, or 100 mcg/kg/day did not show any evidence of carcinogenic potential. However, at 100 mcg/kg/day, male rats were only treated for 82 weeks, and the maximum tolerated dose (MTD) was not reached in the mouse study. The high dose (100 mcg/kg) corresponds to exposure levels over 400 times the human exposure at the maximum recommended human ocular dose (MRHOD) of 0.04 mcg/kg, based on plasma active drug levels. Travoprost was not mutagenic in the Ames test, mouse micronucleus test or rat chromosome aberration assay. A slight increase in the mutant frequency was observed in one of two mouse lymphoma assays in the presence of rat S-9 activation enzymes.

Travoprost did not affect mating or fertility indices in male or female rats at subcutaneous doses up to 10 mcg/kg/day [250 times the maximum recommended human ocular dose of 0.04 mcg/kg/day on a mcg/kg basis (MRHOD)]. At 10 mcg/kg/day, the mean number of corpora lutea was reduced, and the post-implantation losses were increased. These effects were not observed at 3 mcg/kg/day (75 times the MRHOD).

PATIENT COUNSELING INFORMATION
Potential for Pigmentation
Patients should be advised about the potential for increased brown pigmentation of the iris, which may be permanent. Patients should also be informed about the possibility of eyelid skin darkening, which may be reversible after discontinuation of TRAVATAN Z® (travoprost ophthalmic solution) 0.004%.

Potential for Eyelash Changes
Patients should also be informed of the possibility of eyelash and vellus hair changes in the treated eye during treatment with TRAVATAN Z® Solution. These changes may result in a disparity between eyes in length, thickness, pigmentation, number of eyelashes or vellus hairs, and/or direction of eyelash growth. Eyelash changes are usually reversible upon discontinuation of treatment.

Handling the Container
Patients should be instructed to avoid allowing the tip of the dispensing container to contact the eye, surrounding structures, fingers, or any other surface in order to avoid contamination of the solution by common bacteria known to cause ocular infections. Serious damage to the eye and subsequent loss of vision may result from using contaminated solutions.

When to Seek Physician Advice
Patients should also be advised that if they develop an intercurrent ocular condition (e.g., trauma or infection), have ocular surgery, or develop any ocular reactions, particularly conjunctivitis and eyelid reactions, they should immediately seek their physician's advice concerning the continued use of TRAVATAN Z® Solution.

Use with Contact Lenses
Contact lenses should be removed prior to instillation of TRAVATAN Z® Solution and may be reinserted 15 minutes following its administration.

Use with Other Ophthalmic Drugs
If more than one topical ophthalmic drug is being used, the drugs should be administered at least five (5) minutes between applications.

Rx Only
U.S. Patent Nos. 5,631,287; 5,889,052, 6,011,062; 6,235,781; 6,503,497; and 6,849,253

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ALL IN THE FAMILY

By the beginning of the 21st century, contact lenses had become a booming success—but remained a continual source of educational need. So in January 2000, *Review of Optometry* launched a new magazine devoted to the field: *Review of Contact Lenses* (ultimately renamed *Review of Cornea & Contact Lenses*, or *RCCL* for short). Much of the routine contact lens coverage *Review* was known for migrated there, with an emphasis on addressing concerns of contact lens specialists in greater detail.

RCCL's debut issue covered topics still relevant today, including fitting the post-surgical patient, properly caring for lenses and use of topography for contact lens fits, complications associated with lens wear during allergy season or in the case of an irregular cornea. Advances in antibiotics were also covered, as was the debate over how to charge for contact lenses.

contact lens wear also began to arise—and confuse.[20]

Lens care back then was a chore. Heat disinfection was a fiddly business that patients disliked. A section in the October 1979 issue of *Review of Optometry* discussed the status of several cleaning and disinfection solutions—addressing challenges in wearers who are allergic to chemical preservatives and educating readers about new and emerging options.[11,22] Other late-'70s articles, such as "How Effective Are Soft Lens Cleaners?" and "Putting Care Back into Contact Lenses," considered whether these products were suited to the consumers to which they were marketed, and how to best educate wearers on options.[23,24]

These were days of rapid evolution in contact lens products and protocols. An informal 1979 survey mailed to 200 Midwest contact lens practitioners asking what contact lens-related subjects they would most like to hear about in a lecture found that general interest in that period was predominantly focused on new contact lens materials coming to market, practice improvement techniques including how to train staff members, and what kinds of new devices were available to assist with lens fittings.[11]

Breakthroughs were indeed on the way. The dawn of the 1980s brought 30-day extended wear—a mixed blessing, to be sure, as the complications set off a backlash against contact lens wear—and "planned replacement" of lenses for greater convenience and safety. Once manufacturing capacity ramped up, daily disposables became a reality with Vistakon's launch of Acuvue in 1987.

Nowadays, numerous journals, periodicals and even conferences have become dedicated entirely to the subject of contact lens research and development—a far cry from decades prior. "Looking at the 1946 volume of the *American Journal of Optometry* and *Archives of American Academy of Optometry*, I found that there were six original papers and six abstracts published relating to contact lenses," wrote Henry A. Knoll in a letter to the Optometric Historical Society, published in its April 1976 newsletter. "These days, when you pick up a journal, there is a good chance that there will be a contact lens article between the covers. On the other hand, we still have a lot to learn."

The continuing introduction of new contact lens materials, technology and accessories throughout the years has pushed contact lenses from a simple idea to one of the most popular forms of vision correction worldwide. Remaining issues like user noncompliance, dropout and the desire for contact lenses to work in increasingly complicated scenarios—for example, post-surgery, as a means to monitor systemic health or on highly irregular corneas—mean there's still plenty of problems for optometrists to master. ■

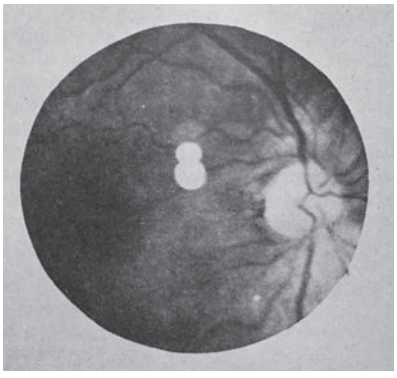
1. Fick A. Contactbrille. Archiv für Augenheilkunde, March 1888:279-287.
2. Antique Spectacles and Other Vision Aids. A Brief History of Contact Lenses. Available at: www.antiquespectacles.com/topics/contacts/contacts.html. Accessed June 7, 2016.
3. Princeton University. The Development of Contact Lenses. Available at: https://www.princeton.edu/~ota/disk3/1984/8409/840904.PDF. Accessed June 7, 2016.
4. Carlson JJ, Silbert M. THe technique of fitting 'scleraorm' contact lenses. Optical Journal Review. 1946 Oct;34-36.
5. Contact lens Pioneers. Supplement to Review of Optometry, 2009.
6. Hoffsetter HW. Visual science history. Newletter of the Optometric Historical Society. 1972 July;3(3):28.
7. Edward Hand Medical Heritage Foundation. A History of Contact Lenses. http://edwardhandmedicalheritage.org/images/History_of_Contact_Lenses.pdf. Accessed June 7, 2016.
8. Andrew Gasson. Contact Lens History. The Overseas Pioneers. Available at: www.andrewgasson.co.uk/opioneers_gyorffy.htm. Accessed: June 7, 2016.
9. University of Buffalo. Contact Lens Polymers. Available at: http://wwwcourses.sens.buffalo.edu/ce435/2001ZGu/Contact_Lens/ContactLensReport.htm. Accessed: June 7, 2016.
10. The AOA Foundation. How Soft Contact Lenses Came to the US. Available at: www.aoafoundation.org/ohs/hindsight/how-soft-contact-lenses-came-to-the-usa/. Accessed: June 8, 2016.
11. Pavlichko JL. News & Notes About Contact Lenses. Rev Optom. 1979 Oct;116(10):41.
12. Verma SB, Janoff LE. Determining back vertex dioptric power of a hydrophilic contact lens. Rev Optom. 1973 Oct;110(19):27-29.
13. Koetting RA. Why not use the radioscope to measure soft lenses? Rev Optom. 1973 Oct;110(20):34.
14. Paige N. The plus lens increment system for prognosis in orthokeratology. Rev Optom. 1975 Feb;111(4):7-8.
15. Warren GT. The single contact lens and anisometropic patients. Rev Optom. 1975 Jan;112(7):17-18.
16. Ed. Number and percent of population 3 years of age and over with corrective lenses, by age and sex: United States, 1971. Rev Optom. 1973 Jun;110(11):25.
17. Ed. Contact lens users begin young. Rev Optom. 1975 Aug;112(15):33.
18. Kelly C. Contact Lenses. Rev Optom. 1975 Jul;112(14):20-26.
19. Guerrein RL. Outlook for the contact lens industry. Rev Optom. 1975 Nov;112(22):38-41.
20. Heimann RA. Opticianry's look at national health insurance. Rev Optom. 1975 Dec;112(24):36-37.
21. Acone P. The contact lens coup. Rev Optom. 1977 Apr:48-49.54.
22. Weiss SG. Delusions about contact lens fitting. Optical Journal Review. 1945 June:25-27.
23. Kleist FD, Thorston JC. How effective are soft lens cleaners? Rev Optom. 1978 April:43-49.
24. Ed. Putting care back into contact lenses. Rev Optom. 1978 Apr;115(4)89-93.

THE RETINA: WE CAME, WE SAW, WE TREATED

As our technological developments grew, so did our capabilities.

BY MARK T. DUNBAR, OD

The Optometric Retina Society refers to posterior segment care as "the new optometric frontier." While that characterization is accurate in many ways, the fact is that optometrists have been examining, diagnosing and comanaging diseases of the retina for more than 100 years. The ability to manage these diseases was often preceded by the development of monitoring technology. Every step of the way, *Review of Optometry* has been there as a beacon to clinicians, shining its light on the innovations that would steer them faithfully toward the future.



***The Optical Journal and Review of Optometry* was one of the early venues to obtain education using images, such as this shot from a 1940 issue. However, the ability to reproduce these images in high quality, or even in color, was extremely limited.**

BACK IN TIME

Once researchers understood it was possible—using feline cadaver eyes—to visualize the fundus and the entrance of the optic nerve, engineers went to work designing an instrument with which to do so for the living eye.[1] That's when, in 1847, English mathematician Charlie Babbage presented "the model of an instrument … for the purpose of examining the interior of the living eye. It consisted of a small plane glass mirror from which a portion of the silvering had been removed."[1] Eventually, this instrument was independently redesigned by Hermann von Helmholtz to provide better illumination and the modern ophthalmoscope had its original ancestor.[1]

In 1915, Francis A. Welch and William Noah Allyn refined the ophthalmoscope even further by designing a hand-held, direct illuminating device. (On a side note, the company they started after this invention, Welch Allyn, still thrives as a manufacturer of a variety of medical devices).

From there, innovation snowballed and, with it, optometry's understanding of several retina-based diseases. For instance, "it was soon discovered that many conditions of the blood, and the vessels, became manifest in the retina, through a change in the size and tortuosity of the vessels, and through the size and arrangement and location of a small area of inflammation or atrophy, which invariably followed such blood diseases as Uremia, Leukemia, Syphilis, Diabetes, and Albuminuria," reads a 1933 issue of *Review*.[2] In fact, the successors of the original ophthalmoscope would become useful in identifying systemic diseases such as arteriosclerosis (as was documented in a November 1940 issue of *Review*) and diabetes.[3]

A NEW WAVE

Fifty years after that, another big technological leap would redefine retina care: the development of fluorescein angiography (FA) for the eye. This technique—

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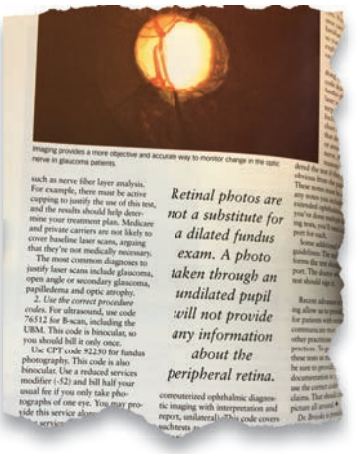
developed for diagnosis of ocular conditions in the 1960s—would go on to become the standard of care for imaging ocular circulation and the diagnosis of vascular disease. It is also of particular value in detecting and defining physiologic and anatomic changes in the fundus. So much of our understanding of retinal diseases was based on discoveries seen with FA. By giving us the ability to observe the fine meshwork of choroidal neovascularization (CNV), it became essential in the classification of retinal vein occlusions (ischemic vs. nonischemic) as well as helping to determine the extent and severity of diabetic retinopathy and other conditions.

The advancement of FA and the ability to diagnose diseases earlier led to treatments for many of the more common retinal diseases such as macular degeneration and diabetic retinopathy. The ability to distinguish CNV on FA led to a new classification system for CNV that became the basis for the macular photocoagulation study (MPS), which resulted in the first successful treatment for wet macular degeneration. As exciting as that time in eye care was, it was only the tip of the iceberg for things to come.

During that era, optometry gained significant ground in scope of practice laws. By the 1980s, ODs achieved parity with ophthalmologists in the ability to perform comprehensive eye exams, pupillary dilation and retinal examination with indirect ophthalmoscopy.


imaging provides a more objective and accurate way to monitor change in the optic nerve in glaucoma patients.

such as nerve fiber layer analysis. For example, there must be active cupping to justify the use of this test, and the results should help determine your treatment plan. Medicare and private carriers are not likely to cover baseline laser scans, arguing that they're not medically necessary.

The most common diagnoses to justify laser scans include glaucoma, open angle or secondary glaucoma, papilledema and optic atrophy.

2. *Use the correct procedure codes.* For ultrasound, use code 76512 for B-scan, including the UBM. This code is binocular, so you should bill it only once.

Use CPT code 92250 for fundus photography. This code is also binocular. Use a reduced services modifier (-52) and bill half your usual fee if you only take photographs of one eye. You may provide this service alone

Retinal photos are not a substitute for a dilated fundus exam. A photo taken through an undilated pupil will not provide any information about the peripheral retina.

computerized ophthalmic diagnostic imaging with interpretation and report, unilateral. This code covers

A 1999 article warned readers that a photo taken through an undilated pupil could not image the peripheral retina.

LET'S GET DIGITAL

In a 1989 *Review of Optometry* issue focusing on the "tools of tomorrow," Larry Alexander, OD, author of the highly-regarded *Primary Care of the Posterior Segment*, explained, "With today's [that is—1989's] instruments, it's often difficult to detect small color shifts that herald vascular changes or edema […] soon, we will have a highly sophisticated, sensitive instrument that will help solve many of these concerns, an instrument called a digital imager."[4] He said this device will "integrate a camera and a computer to create, enhance, analyze and store three-dimensional pictures" as well as create a topographic map on the retinal surface, calculate the true color density of the area and enhance various aspects of the image, such as the brightness or contrast.[4] He was right on the money as, today, digital cameras populate our exam lanes. These devices brought their own controversies. For instance, an April 1999 article pointed out that "retinal photos are not a substitute for a dilated fundus exam. A photo taken through an undilated pupil will not provide any information about the peripheral retina."[5] Today, the mainstream use of Optos widefield nonmydriatic fundus camera even challenges that tenet.

As important as this technology is, its path to success wasn't as smooth as you might expect. Considerable controversy surrounded how to use it in clinical practice and whether it could be a substitute for a dilated fundus exam. In June 2002, *Review* chronicled the launch of the Optomap Panoramic 200, which allowed a 200-degree field of view without pupillary dilation.[6] Several ODs surveyed in the article raved about the quality of the imaging and the extent of the field of view. "We have found ourselves viewing areas of the retina the we oftentimes overlook with routine dilation" reported one OD. When asked if devices like that one could be a substitute for a dilated fundus exam, the consensus was "it does not: Anybody that tells you that is lying."[6]

Today's fundus imaging has evolved to smaller, more portable cameras with better nonmydriatic imaging, electronic illumination control, automated eye alignment and high-res digital image capture. They incorporate more patient-friendly light sources such as LEDs as well as laser scanning imaging. These improvements have helped make modern fundus photography a standard in almost every ophthalmic practice.

THE EASE OF BEING GREEN

The innovation of digital cameras went hand in hand with another development from the 1990s—idocyanine green (ICG) angiography. Using this approach, traditionally associated with cardiovascular care, eye care professionals could pair the dye with the new, sensitive digital cameras for real-time visualization of the deeper vascular structures, enabling a better understanding of diseases that involve the choroid and retinal pigment epithelium. It was through ICG angiography that we learned that central serous is a choroidal disease that

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What You Can Learn from Retinal Mapping

Advances in fundus imaging allow us to detect retinal complications from diabetes before they threaten sight. By JEFFREY S. EISENBERG, Senior Editor

While dilation and fundus photography are the mainstays of diagnosing vision-threatening complications from diabetes early on, problems aren't always readily apparent.

Consider this patient who recently presented to optometrist Joe Dowell's Plano, Texas, practice. A 43-year-old white female with a 20-year history of type 1 diabetes complained of dimness in her vision. Visual acuity was 20/20 O.D. at distance and near, refraction remained stable, and the slit lamp and dilated fundus examinations were unremarkable.

Retinal mapping, however, showed a slight thickening, indicating that she had mild diabetic macular edema. Dr. DeLoach instructed the patient to return for a repeat retinal thickness analysis in three months, and plans to refer her to a retinal specialist for laser treatment if the edema appears to progress. "With her excellent acuity and normal clinical picture, this would be one of those cases where you would have missed the slight macular edema," he says.

With advances in technology for mapping the retina, a diagnosis such as Dr. DeLoach's is less likely to be missed. That's good news given that 12,000-24,000 people go blind from diabetic retinopathy each year.[1] Here, we'll look at what you can learn from retinal maps.

Least Apparent Problem

Diabetic macular edema and proliferative diabetic retinopathy pose the most significant threats to vision in diabetic patients.

An abnormal accumulation of fluid in the retinal tissue characterizes macular edema, which explains the accompanying increase in retinal thickness.[2] The Early Treatment Diabetic Retinopathy Study (ETDRS) labels macular edema as clinically significant if you observe retinal thickening or hard exudate associated with adjacent retinal thickening within 500 microns of the center of the foveal avascular zone.[3] According to ETDRS, however, diabetic macular edema is successfully treated with laser photocoagulation.

Problem is, diabetic macular edema is also one of the hardest conditions to detect. "You can have zero to minimal compromise of visual acuity and still have macular edema," says Louisville, Ky., optometrist Larry Alexander.

Indeed, researchers have confirmed that retinal thickening from diabetic macular edema is not associated with the presence of clinically visible pathology. This finding, they say, is proof of the necessity to

The Retinal Thickness analyzer provides quantitative mapping of retinal thickness over the entire posterior pole.

Retinal thickness maps of a patient with DME indicate significant thickening of the foveal area (upper circle top, lower circle bottom).

assess retinal thickness in order to diagnose diabetic macular edema.[4] Though such methods as stereophotography, slit-lamp biomicroscopy and fluorescein angiography are useful in identifying many cases, even they are not always able to detect diabetic edema early on. Consider these results of one study:[5]

- Slit-lamp biomicroscopy missed small amounts of thickening (1.5 times above normal). In other instances, slit lamp examination led clinicians to overestimate the size of the thickened area.
- Stereophotography did not identify locations with mild or localized thickening. Also, doctors' base grading on local differences rather than comparisons with normal values, thus hindering the detection of diffuse edema.
- With fluorescein angiography, 96% of the locations with twice the normal amount of thickness depicted fluorescein leakage outside the fovea. However, appreciable fluid accumulation did not always accompany this, as demonstrated by fluorescein leakage at 72% of the sites with normal retinal thickness.

Research also shows that while fluorescein angiography is sensitive to the vascular leakage that causes macular edema, actual retinal thickening is better correlated with loss of visual acuity.[3]

Hence, there's the need for a method to measure the amount of retinal thickening in order to identify patients with diabetic macular edema early on, and to evaluate the effectiveness of treatment.[3]

Analyzing Thickness

One such instrument designed to address this need is the Retinal Thickness Analyzer (RTA) from Talia Technology Ltd. Talia first introduced the RTA overseas in 1991 and in the United States in 1997.

Originally listed at $90,000, the technology was beyond reach of most optometric practices. The list price has since dropped to $57,800, and special programs are available. Talia also has introduced a second-generation version of the RTA that is more compact and automated, making the technology more practical for O.D.s' offices.

This 3-D, multi-purpose system combines a fundus camera and computerized scanning slit lamp to measure retinal thickness between the internal limiting membrane and the retinal pigment epithelium, where 50-60% of the ganglion cells are. "The registration software and high reproducibility of the system makes it very effective in picking up very small and subtle changes in thickness and thinning," Talia spokeswoman Kathleen Hand says.

The test is non-invasive and takes 3-4 minutes per eye. Using a narrow slit of green helium-neon laser light and digital camera, the RTA takes five 3-by-3mm scans of the retina, starting at the center of the fovea, followed by the upper right and left, and lower right and left portions. With the fundus image and blood vessels as a guide for accuracy and repeatability, it overlays each scan for an overall 6-by-6mm scan.

The RTA's computerized algorithm analyzes optical cross-sections and provides registered thickness maps and comparative reports, including disc topography. The instrument compares to a comprehensive database showing a color scale. Cooler colors show a thinner area, while warmer colors show thickening of edematous layers. The RTA gives specific measurements in microns at each of 1,280 data points.

Dr. DeLoach considers the RTA's "versatility" to be its chief advantage. Because it takes measurements at several different portions, clinicians can use it to diagnose glaucoma, diabetic retinopathy and maculopathy. And, he says, it shows ischemic changes in the nerve fiber layer.

One disadvantage of this device: Media opacities may affect results. "If you have extensive lens changes, the quality of your imaging does decline," Dr. DeLoach says. "If you have advanced lens changes, you really just don't get acceptable images that are clinically useful," he says.

Several studies have demonstrated the ability of the RTA to measure retinal thickness in comparison

This 2001 *Review of Optometry* article introduced readers to the many applications of optical coherence tomography. In retina care, imaging technology has always driven the OD's ability to manage disease.

has secondary effects in the retina and RPE. In patients with posterior uveitis, ICG became an essential tool for the diagnosis and understanding of conditions such as multiple evanescent white dot syndrome (MEWDS) and multifocal choroiditis and panuveitis, which predominantly involve the choroid. Interesting, as important as ICG was, it never gained the kind of traction or had the impact of traditional fluorescein angiography, though it is still an important tool retinal specialists commonly use today.

OCT, SURPRISE!

In September 2001, *Review* featured a report titled "What You Can Learn from Retinal Mapping," in which optical coherence tomography (OCT) was described as a technology that "works like a B-scan ultrasound to provide cross-sectional images of the retina […] allowing a 10µm to 20µm resolution."[7] The writers may not have known it at the time, but OCT would go on to be, perhaps, the most significant technological discovery in modern eye care. The article discussed OCT's ability to detect diabetic macular edema (DME); in fact, "in some instances the OCT detected thickening when biomicroscopy did not."[7]

In 15 years, the machines have only improved, upgrading from time-domain to spectral-domain OCT (SD-OCT), and a variety of offshoots. A 2009 article, "Get Familiar with SD-OCT," offered an extensive tour of SD-OCT in which five cases demonstrate how SD-OCT can "illustrate retinal anatomy in better detail than clinical observation alone."[8]

ODs JUST WANNA HAVE FUNDUS AUTOFLUORESCENCE

Also emerging in the early 2000s, a new way to image the back of the eye became another essential tool for imaging macular disease. Fundus autofluorescence (FAF) uses the fluorescent properties of lipofuscin to study retinal disease in vivo.

FAF can be used to image macular degeneration, Stargardt's disease, retinitis pigmentosa and central serous retinopathy. FAF was also a recommended modality for following patients on Plaquenil (Covis Pharmaceuticals).

In *Review's* 2012 guide to retinal disease, Jeff Gerson, OD, provided a comprehensive review of FAF.[9] His report states "not only can FAF be an ideal tool for documentation, but also it will often serve as a diagnostic modality because the device can elucidate many conditions that are invisible through traditional means of examination."[9]

Dr. Gerson went on to say that "FAF can detetect structural abnormalities and predict functional defects."[9]

THE FUTURE'S SO BRIGHT, I GOTTA WEAR SHADES

Looking ahead, it seems adaptive optics may be among the next generation of imaging technologies—one that may provide even higher quality images than today's OCT. By correcting for aberrations in the eye through improvements in lateral resolution, adaptive optics is able to achieve resolutions of about 2µm, high enough to identify even cone photoreceptors. This tool is still in its infancy and is limited to research use. It likely won't be commercially available any time soon, but it represents another important evolutionary step in imaging.

In the last 125 years, ODs have seen some incredible advances with imaging innovations that are only picking up momentum as time goes on. Lucky for us, *Review of Optometry* has been there every step of the way. ■

1. Poser M. History of the Ophthalmoscope. Optical Journal-Review. 1941;78(2):106-18.
2. Breakthrough in diagnostic technology. Review of Optometry, 2011;148(8):55.
3. Tower P. Fundus changes in the arteriosclerosis. Optical Journal and Review of Optometry. 1940;21:20-23.
4. Alexander L. A new image for fundus evaluation. Review of Optometry. 1989;126(9):42-44.
5. Brooks R, Quinn C. How to get reimbursed for retinal photography. Review of Optometry. 1999;136(4):69-72.
6. Black A. Panoramic200: A new protocol for dilation. Review of Optometry. 2002;139(6);41-2.
7. Eisenberg J. What you can learn from retinal mapping. 2001;138(9):68-74.
8. Slotnick S, Sherman J. Get familiar with SD-OCT. Review of Optometry. 2009;146(6):79-85.
9. Gerson J. The clinical utility of fundus autofluorescence. Review of Optometry: 9th Annual Guide to Retinal Disease. 2012;149(4):S3-S5.

THE IMPORTANCE OF FAMILY

Melissa Barnett, OD, FAAO, FSLS
UC Davis Eye Center, Sacramento, California

Each patient that enters our office has a unique lifestyle, with individual visual and ocular needs. Each patient has a different environment and schedule that may vary each day. Some patients put a high priority on stable vision, while others value the ability to wake with clear vision. Since no two patients are alike, it is important to view each patient as an individual and try to meet his or her needs and prescribe accordingly.

The AIR OPTIX® family of silicone hydrogel (SiHy) contact lenses serve as my perfect "go-to" brand, as the lenses meet the unique needs of patients; and the monthly replacement schedule helps promote compliance.[1-3] Just like how our personal families share the same DNA traits, the AIR OPTIX® family shares SmartShield™ Surface Technology.[4] This proprietary surface technology safeguards against the inherent hydrophobic property of silicone by creating a smooth protective barrier on the contact lens.[5] Exposure to air causes silicone molecules to reorient and turn their hydrophobic ends towards the contact lens surface causing dry spots. This can attract other hydrophobic compounds, such as tear lipids, and resist wetting of the lens. SmartShield™ Surface Technology helps maintain moisture on the lens and resist deposits by helping to prevent the rotation of hydrophobic sites to the contact lens surface.[5-8]

When a patient presents with deposits on his or her contact lenses, consider which brand of contact lenses he or she is wearing. In my office, it is a very rare occasion to see deposits in patients who are wearing AIR OPTIX® lenses, likely due to the SmartShield™ Surface Technology. In fact, studies show that after one month of daily wear, the AIR OPTIX® AQUA lenses have lower overall cholesterol sorption into the lens than the other two-week and monthly replacement lenses tested.[7,9] The lenses also exhibit superior wettability compared to other SiHy lenses.[10]

While the entire AIR OPTIX® family of SiHy contact lenses feature SmartShield™ Surface Technology, AIR OPTIX NIGHT & DAY AQUA contact lenses boast the highest oxygen transmissibility of any available soft contact lens for white, healthy-looking eyes.[11] Think of the new mom who is up several times at night, or the college student studying all night and falling asleep at his desk. These patients have the option of wearing AIR OPTIX® NIGHT & DAY® AQUA and will experience clear and comfortable vision regardless of the time of day (or night).

Some of my patients like to transform their look from day to day. Giving my patients the flexibility to alter their eye color can be done with AIR OPTIX® lenses. AIR OPTIX® COLORS contact lenses allow patients to enhance or dramatically change their natural eye color without a refit from AIR OPTIX® AQUA sphere lenses.[12] I proactively ask patients about their interest in color contact lenses in my practice prior to commencing a contact lens fit, and a surprising number of them are interested in wearing color contact lenses.[13] For patients with astigmatism or presbyopia, AIR OPTIX® for Astigmatism and AIR OPTIX® AQUA Multifocal contact lenses fill that need. Engineered to work with the eye's blinking mechanism, AIR OPTIX® for Astigmatism PRECISION BALANCE 8|4™ Lens Design keeps lenses consistently stable throughout hours of wear.[14] AIR OPTIX® AQUA Multifocal contact lenses PRECISION PROFILE™ Design provides presbyopic patients with clear, uninterrupted vision at all distances—far distance, intermediate, and near. A recent survey of those in the Generation X population show patients are taking steps to appear younger such as dyeing their hair or wearing youthful clothing. Also, in general, they believe reading glasses make someone look older.[15] AIR OPTIX® AQUA Multifocal contact lenses enable my presbyopic patients to continue to wear contact lenses while successfully maintaining their youthful appearance.

Having a family of contact lenses such as the AIR OPTIX® brand allows me to fit patients of varying ages, lifestyles, and visual and ocular needs. The AIR OPTIX® family of contact lenses delivers innovative technologies, and the monthly replacement schedule helps to promote patient compliance.[2-4] Communicating the benefits of these contact lenses is simple because they each share SmartShield™ Surface Technology and the breathability of lotrafilcon as their core. Having the AIR OPTIX® family of contact lenses at my fingertips helps my patients see, look, and feel their best.

Important information for AIR OPTIX® AQUA (lotrafilcon B) contact lenses, AIR OPTIX® AQUA Multifocal (lotrafilcon B) contact lenses, AIR OPTIX® for Astigmatism (lotrafilcon B) contact lenses: For daily wear or extended wear up to 6 nights for near / far-sightedness. Risk of serious eye problems (i.e., corneal ulcer) is greater for extended wear. In rare cases, loss of vision may result. Side effects like discomfort, mild burning or stinging may occur.

Important information for AIR OPTIX® COLORS (lotrafilcon B) contact lenses: For daily wear only for near/far-sightedness. Contact lenses, even if worn for cosmetic reasons, are prescription medical devices that must only be worn under the prescription, direction and supervision of an eye care professional. Serious eye health problems may occur as a result of sharing contact lenses. Although rare, serious eye problems can develop while wearing contact lenses. Side effects like discomfort, mild burning or stinging may occur. To help avoid these problems, patients must follow the wear and replacement schedule and the lens care instructions provided by their eye doctor.

Important information for AIR OPTIX® NIGHT & DAY® AQUA (lotrafilcon A) contact lenses: Indicated for vision correction for daily wear (worn only while awake) or extended wear (worn while awake and asleep) for up to 30 nights.

Relevant Warnings: A corneal ulcer may develop rapidly and cause eye pain, redness or blurry vision as it progresses. If left untreated, a scar, and in rare cases loss of vision, may result. The risk of serious problems is greater for extended wear vs. daily wear and smoking increases this risk. A one-year post-market study found 0.18% (18 out of 10,000) of wearers developed a severe corneal infection, with 0.04% (4 out of 10,000) of wearers experiencing a permanent reduction in vision by two or more rows of letters on an eye chart. **Relevant Precautions:** Not everyone can wear for 30 nights. Approximately 80% of wearers can wear the lenses for extended wear. About two-thirds of wearers achieve the full 30 nights continuous wear. **Side Effects:** In clinical trials, approximately 3-5% of wearers experience at least one episode of infiltrative keratitis, a localized inflammation of the cornea which may be accompanied by mild to severe pain and may require the use of antibiotic eye drops for up to one week. Other less serious side effects were conjunctivitis, lid irritation or lens discomfort including dryness, mild burning or stinging. **Contraindications:** Contact lenses should not be worn if you have: eye infection or inflammation (redness and/ or swelling); eye disease, injury or dryness that interferes with contact lens wear; systemic disease that may be affected by or impact lens wear; certain allergic conditions or using certain medications (ex. some eye medications). **Additional Information:** Lenses should be replaced every month. If removed before then, lenses should be cleaned and disinfected before wearing again. Always follow the eye care professional's recommended lens wear, care and replacement schedule. Consult package insert for complete information, available without charge by calling **(800) 241-5999** or go to **myalcon.com**.

References **1.** Alcon data on file, 2013. **2.** Dumbleton K et al. Compliance with lens replacement and the interval between eye examinations. *Optom Vis Sci*. 2013;90:351-358. **3.** Dumbleton K et al. Patient and practitioner compliance with silicone hydrogel and daily disposable lens replacement in the United States. *Eye & Contact Lens*. 2009;35:164-171. **4.** Alcon data on file, 2012. **5.** Alcon data on file, 2012, 2013. **6.** Alcon data on file, 2013. **7.** Nash W et al. A comparison of various silicone hydrogel lenses; lipid and protein deposition as a result of daily wear. *Optom Vis Sci*. 2010;87: E-abstract 105110. **8.** Nash W, Gabriel M. Ex vivo analysis of cholesterol deposition for commercially available silicone hydrogel contact lenses using a fluorometric enzymatic assay. *Eye Contact Lens*. 2014;40:277-282. **9.** Compared to ACUVUE® OASYS®, ACUVUE® ADVANCE, PureVision®, and Biofinity® lenses; Ex Vivo measurement of total lipid and total cholesterol uptake in lenses worn daily through manufacturer-recommended replacement period; CLEAR CARE® cleaning and disinfecting solution used for cleaning and disinfection; Significance demonstrated at the 0.05 level; Alcon data on file, 2008, 2014. **10.** Compared to ACUVUE® OASYS®, ACUVUE® ADVANCE, PureVision®, Biofinity®, and Avaira® lenses; In vitro measurement of contact lens angles on unworn spherical lenses; significance demonstrated at the 0.05 level; Alcon data on file, 2009. **11.** Based on the ratio of lens oxygen transmissibilities; Alcon data on file, 2008, 2009. **12.** Alcon data on file, 2013. **13.** Based on a survey of 375 U.S. consumers interested in or wearing color contact lenses; Alcon data on file, 2013. **14.** In a randomized, subject-masked, multi-site clinical study with over 150 patients; Significance demonstrated at the 0.05 level; Alcon data on file, 2005. **15.** Alcon data on file, 2015.

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GLAUCOMA THROUGH TIME

Through educational, legal and technological barriers, optometrists have been managing glaucoma for decades.

BY JAMES L. FANELLI, OD

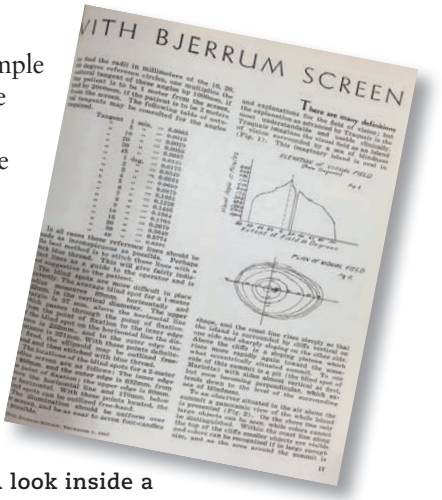
I have had the pleasure of taking a walk back in time by looking over a few glaucoma-focused articles published as far back as the 1930s. It's been an interesting journey. Some things, in particular technological advances, have skyrocketed optometry and its role in managing glaucoma. Other topics have changed very little.

Allow me to be your tour guide as we step back in time to glaucoma treatments of yesteryear.

A FOOT IN THE DOOR

In 1937, a lecturer at the University of California, Berkeley, penned two columns that appeared in *Review* relating to perimetry and the study of the visual fields.[1,2] His first words echo that most of the basics of perimetry and the visual field are based on neuronal and retinal anatomical considerations established in the preceding 40 years.[1] That tenet still exists. Visual field loss—whether it occurs from glaucomatous, neuro-ophthalmic or retinal origins—is always correlated with anatomic foci of aberrant or damaged tissue. While perimetric techniques have changed since that time, the interpretation and correlation to the structural etiology of the field defect remains the same: we examine the field defect and determine its anatomical source by essentially dividing visual field loss into three categories: prechiasmal field loss, chiasmal field loss and retrochiasmal field loss.

While the topic of these columns pertained to the optometric use of visual field testing devices, it centered on glaucomatous field loss. Interestingly, a portion of the column was spent describing the construction of a tangent screen, its simple design and the simple materials used. The slant was to stimulate an interest among optometrists that, with some easily obtained materials, one could construct a tangent screen and begin measuring visual fields. Many ODs today only think of automated perimetry. But, back in the day, some of us were trained on kinetic perimetry. Tangent screens were elegant, simple and, with proper technique, able to help identify glaucomatous field defects. However, they were labor intensive. Subsequently, Goldmann perimetry was developed, and used for many years clinically. While I was at the Pennsylvania College of Optometry, we had the first exposure to the newest form of perimetry: the fully automated Humphrey perimeter. It was about the size of a refrigerator, but it heralded the era of automated perimetry. One fundamental difference between tangent screens (and Goldmann perimeters) versus these new Humphrey perimeters, was stimulus presentation. While I did not use a tangent screen (I'm


ITH BJERRUM SCREEN

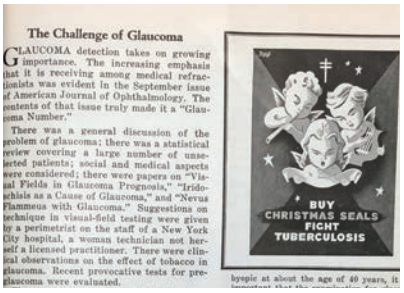
A look inside a 1937 *Optical Journal and Review of Optometry* article on glaucoma.

old, but not that old!), I did regularly use a Goldmann perimeter. These perimeters presented a kinetic stimulus to the patient. The mechanics from the patient's point of view were the same: they pushed a button when they "saw the light." Goldmann perimeters could be deadly accurate, but one needed a superb technician driving the test to obtain that accurate field study. Needless to say, standardization of testing parameters became the norm, along with less dependence on technician abilities. Thus, the huge switch to what we know today: standard automated perimetry (SAP). Of course, typical SAP strategies use a stationary fixed stimulus rather than a kinetic stimulus, but the end result, ultimately, is the same identification of a visual field defect.

One can go back today and read Hobson's columns, and gain a good and rather accurate understanding of the anatomical correlates to visual field defects. One of the most useful graphics in understanding visual fields, as seen in his columns, is the illustration of the field of vision as a 'hill of vision', or sometimes called an island of vision in a sea of blindness. That graphic is a great tool in understanding the relationship between sensitivity of retinal fields, and the relationship between sensitivities and distances from the central retina. It worked then, and it still works today. And it is the basis of visual field testing just as much today as visual field testing back in the early 1900s.

AN INVITATION

In the early 1940s, Harold Noyes, MD, penned a column that appeared in *The Optical Journal*, for optometrists, outlining the various types of glaucoma known at that time.[3] The intent of his column was to educate optometrists about glaucoma, in the hopes that a well-trained and well-equipped optometrist could detect the disease and subsequently refer the patient for appropriate care. Remember, this was well before any optometrists could legally use diagnostic or anesthetics drops. I'm sure it was a bold move at the time and I would guess he caught some heat for discussing glaucoma in an optometric journal. But he must have realized an inevitable truth: the majority of patients at the time sought refractive care and, therefore, ended up seeing an OD for their visual needs. With the OD as the entry point into the eye care system, he realized that educating this group of professionals was important in identifying those individuals who had glaucoma. Sure, ODs of this time could not treat the disease, but at least they could facilitate appropriate care for the patient.


The Challenge of Glaucoma

GLAUCOMA detection takes on growing importance. The increasing emphasis that it is receiving among medical refractionists was evident in the September issue of American Journal of Ophthalmology. The contents of that issue truly made it a "Glaucoma Number."

There was a general discussion of the problem of glaucoma; there was a statistical review covering a large number of unselected patients; social and medical aspects were considered; there were papers on "Visual Fields in Glaucoma Prognosis," "Iridochisis as a Cause of Glaucoma," and "Nevus Flammeus with Glaucoma." Suggestions on technique in visual-field testing were given by a perimetrist on the staff of a New York City hospital, a woman technician not herself a licensed practitioner. There were clinical observations on the effect of tobacco in glaucoma. Recent provocative tests for preglaucoma were evaluated.

hypoic at about the age of 40 years, it

A 1950 article, "The Challenge of Glaucoma," runs beside an image ugring readers to "Buy Christmas Seals. Fight Tuberculousis."

His review of the types of glaucoma was fairly accurate, though the methodology of examining the patients was somewhat limited by the technology at the time. He pointed out that the majority of cases of glaucoma fell into the category of what we today call primary "open angle glaucoma," with insidious and asymptomatic onset.[3] He also discussed angle closure glaucoma, which he called "chronic congestive glaucoma," as well as other cases of secondary glaucomas related to retinal vascular diseases, inflammatory diseases and orbital diseases.[3] One comment in the body of the piece speaks volumes to the technology at the time. He references that many cases of glaucoma initially labeled "simple glaucoma" may become recharacterized as a separate, different type of glaucoma with the use of a slit lamp to examine the eye and finding subtle differences and signs.[3] Imagine that? Using a slit lamp to aid in the diagnosis of glaucoma!

JOINING THE DIAGNOSTIC TEAM

By the early '50s, doctors recognized glaucoma was more prevalent than initially believed and that, because optometrists were often the first providers patients saw, it was incumbent upon us to become versed in identifying glaucoma patients. It was time for ODs to become a part of the diagnostic team. Interestingly, one of the columns from 1950 references the hearings on Capitol Hill for ODs to become a part of the outpatient care clinics in the Veterans Administration (VA) system, and how the diagnosis of glaucoma was used in arguments against ODs providing care. Sound familiar?

In 1951, a column titled "The Optometric Aspects of Glaucoma," described examination techniques needed to identify the disease.[4] Schiotz tonometry was a must, according to the article.[4] Corneas should be clear and evaluation of the anterior segment should at least be accomplished with a plus condensing lens and a goose neck lamp.[4] Finger palpation of the globes was recommended, too.[4] Ophthalmoscopic findings consistent

with glaucoma were discussed, as were gonioscopic findings.[4] Remember, optometrists were still restricted from using diagnostic pharmaceutical agents in every state. However, the education process had begun.

In the world of optometric legislation, there is a wise saying: educate before legislate. Needless to say, this means that prior to legislating expanded OD licensure, it is incumbent upon the OD to be educated in a particular area or set of procedures. So, the wheels began to turn, gradually, back then. In 1952, Richard Struhl, OD, asked a basic question: was it not time for ODs to begin using "simple drugs for the detection and diagnosis of various eye diseases?"[5] He quickly followed that up with a comment that these drugs should be nontherapeutic, but that's how change happens. Slowly, over years.

GETTING UP TO SPEED

In the 1970s, optometric diagnostic and therapeutic laws started to pick up steam across the country. In 1975, Marvin Smith, PhD, adapted a lecture in the pages of *The Optical Journal and Review of Optometry* that sought to debunk myths circulating about diagnostic drugs.[6] It may seem quaint today to think simple mydriatics and cycloplegics could be at the heart of such controversy, but in 1975 the debated warranted a four-page rebuttal.

The arguments that Dr. Smith was rebutting were the beginning of a decades long theme when optometric expansion was being criticized by those objecting to it, primarily the medical community. Comments like "topical anesthetics can cause shock, cardiac arrest and death," "eye drops have caused death in infants," and the classic "the public would be exposed to new risk from the use of these drugs [diagnostic agents] by optometrists," and summarized by the other classic: "medical licensure is essential for the use of drugs." To quote Dr. Smith: "The question arises as to why there were, and are, hard fought legislative and court battles between two groups of practitioners who both have the best interests of the public in mind? The answer to this question is indeed that there are myths and misinformation which pervade the use of diagnostic pharmaceutical agents in the eye."[6] Wow! The same tactics are used today by those opposed to optometric scope expansion.

The passage of DPA legislation allowed ODs to begin testing with these formulations and, in many ways, changed what it meant to be an optometrist. This was reflected in the pages of the rebranded *Review of Optometry*. For example, in 1986 virtually none of the magazine's feature headlines even contained the word "glaucoma." A year later, that changed drastically as *Review* launched a bimonthly "Glaucoma Series."[7] This was ground breaking coverage in an optometric journal. Glaucoma was a pervasive disease in the population, but was only treated by those with medical licenses, except in West Virginia and North Carolina where ODs were authorized to treat the condition. In the inaugural installment, Thomas Lewis, OD, covered the topic exquisitely. Interestingly, long before OHTS was even an idea, he noted that only about one in 10 ocular hypertensives actually went on to develop frank glaucoma. But the presence of that article in a national optometric publication was a part of a growing shift toward publishing more information in mainstream publications dealing with the optometric management of conditions involving other than refractive care.

In 1994, it launched its official "annual glaucoma report" issue, a tradition it keeps up today. And I have the honor and privilege of authoring the bimonthly "Glaucoma Grand Rounds" column.

TODAY

Imagine practicing without the prescriptive authority we now have. There is still work to be done. Just recently, New York State was prevented once again from allowing its ODs to prescribe oral pharmaceutical agents. When I graduated, only two states allowed ODs to prescribe TPAs, and Pennsylvania was not one of them. Growing up outside Philadelphia did not change the fact that I would not be able to use the majority of what I was taught. That's how I ended up in North Carolina.

The wheels continue to turn. Often, more slowly than we want. But they need to continue to turn. Perhaps in the anniversary issue 100 years from now, some of the things that we currently do and consider cutting edge will be highlighted as quaint things 'the old-timers' used to do. I can only hope so. ■

1. Hobson JT. Method of procedure with Bjerrum screen. Part 1. Optical Journal-Review. December 1, 1937;64(23):16-8.
2. Hobson JT. Method of procedure with Bjerrum screen. Part 2. Optical Journal-Review. December 15, 1937;64(24):16-8.
3. Noyes HG. Glaucoma, its types and diagnostic symptoms. Optical Journal-Review. December 1, 1941;68(23):18-20.
4. Lopez RB. The optometric aspects of glaucoma. Optical Journal-Review. January 15, 1951;78(2):70-5.
5. Struhl R. Tonometry by optometrists. Optical Journal-Review. January 1, 1952;79(1):42.
6. Smith M. Myths and misinformation concerning use of diagnostic drugs. Optical Journal-Review. November 15, 1975;112(22):28-31.
7. Lewis T. Glaucoma: is your patient at risk? Review of Optometry. January, 1987;124(1):59-62.

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"WE SHALL BE KNOWN AS *OPTOMETRISTS*"

Review has always been there to chronicle—and even influence—the journey to the profession's name.

BY REBECCA HEPP, SENIOR ASSOCIATE EDITOR

How often do you stop to think about a name—what it means or how it was chosen? I, for one, have been doing so a lot. After months of deliberations and many discarded lists, I finally settled on a name for my first child. So it's fitting to be discussing how, and by whom, optometry got its name.

As it turns out, naming an entire profession can be just as difficult as naming a child, and the choice can be just as crucial in shaping the future. How might the profession differ if you were called *visometricians* or *qual-optists*? These were both on the short list when the British Optical Association sought suggestions for a title in 1903.[1] Perhaps luckily, American eye care providers were already well on their way to being known as optometrists by this time.

FROM OPTICIANRY TO OPTOMETRY

The history of the word *optometry* is somewhat debated and, like all good origin stories, it is rife with key players laying claim to the title of founding father.

Many agree the word itself came about as early as 1731, when Scottish physician William Porterfield created what he called an *optometer* to carry out Christopher Scheiner's experiment for measuring refraction.[2] More than 150 years later, both *optometer* and *optometry* appear in Swiss ophthalmologist Edmund Landolt's 1886 textbook *The Refraction and Accommodation of the Eye and Their Anomalies*.[2]

Around that time—the late 1800s—refracting opticians got down to the business of separating themselves from dispensing opticians and felt the desire to rename their nascent profession. *Review of Optometry*, itself no stranger to name changes, debuted in 1891 as *The Optician*. Always an advocate for change, the publication played a key role in the early effort to enact the profession's name change. In 1895, the first issue of the newly renamed *Optical Journal* included an article by R.H. Knowles, MD, which declares, "The instrument used for determining eye defects is called an optometer," and "the science of using this instrument is called optometry."[2]

Just a few years later in 1899, Frederick Boger, *The Optical Journal*'s founder and editor, became the first to lobby for the adoption of the title optometry. "While the term optician fully covers all branches in which opticians are now engaged, the new profession will have to adopt some other title distinctive of what it has to deal with," Mr. Boger wrote. "The word optometry has come much into vogue recently and seems to be popular and to fit the case."[3]

Four years later, the term was officially adopted by the American Optometric Association (then called the American Association of Opticians). As recorded by a 1938 article in *The Optical Journal*, Dr. Emanuel Klein—not Dr. Knowles—coined the term optometrist some time before 1902 as an alternative to *opticist*, which had been advocated by Dr. Charles Prentice.[4] Dr. Klein then suggested to his friend, Dr. John C. Eberhardt, that he introduce a proposal to adopt optometry and optometrist at the 1903 AOA convention in Atlantic City. The proposal was deferred to the next year's convention, during which Dr. Eberhardt, now the president of the AOA, reintroduced it for adoption.

"A long discussion followed but closed with the unanimous adoption of the two words," along with their related definitions.[4]

In a 1941 retrospective, Dr. John Jarvis, then director of the AOA department of public relations, reflected on the vote. "It is my understanding that Eberhardt had been trained as an engineer. He was therefore of that type of mind enamored of accuracy, so he sought a Greek root. The term 'Optician' did not, in his opinion, express clearly enough the work to be done by the fast moving group who wanted a profession."[5]

Image: The Archives and Museum of Optometry

Silver and wood optometers from the 1920s.

The name had its share of detractors, including Dr. Prentice, who steadfastly continued to call himself an opticist. Dr. Jarvis relates an anecdote about Dr. Prentice expressing dislike of the term. During an AOA convention in Rochester, NY, attendees were required to list their profession. "I am more than an optician, but I do not like the term optometrist," Dr. Prentice said to Dr. Jarvis. "I think this is more accurate, and understandable," as he wrote opticist next to his name. Dr. Jarvis recalls that others nearby "made general comment to the effect that, as we would say in the present day vernacular, 'he had something.'" Maybe so, but optometry stuck, despite its shortcomings.[5]

A Greek reader of this magazine pointed out in a 1938 letter to the editor that *opto* in classical Greek means "I see" and thus *optometrist*, strictly speaking, means "I see measurements."[6] Better terms, he said, would be *opticometry* and *opticometrist*, though these too he found unsatisfactory. "The word *metry* represents rather the carpenter who makes measurements than the optometrist who is a professional person correcting the optical defects of the eye" through knowledge of a science. *Opticology* and *opticologist*—or *optico*, for short—the letter-writer felt, did the best job of conveying the profession's scope and skill.

Of course, *The Optical Journal and Review of Optometry*—the name this publication adopted in 1910—continued to play a pivotal role in popularizing the new moniker. A 1941 article admits that, while credit for naming the profession belongs to others, the magazine deserves a place among the founders as well: "the real credit for the final adoption of the title 'Opto'-metrist,' as it was then pronounced, later to become 'Op-tom'-etrist,' must be largely given to Boger."[7] Mr. Boger had once again promoted the term optometry in June of 1904, stating that the name had already been settled before its adoption by the AOA. His proof? Minnesota, California and North Dakota were the first three states to enact laws governing the practice, and they used the term optometrist.[7]

BY ANY OTHER NAME

While optometry was first defined as "the science of non-medical refraction," back in 1904, the name now encompasses a much more robust profession that continues to push for expanded scope of practice.[8]

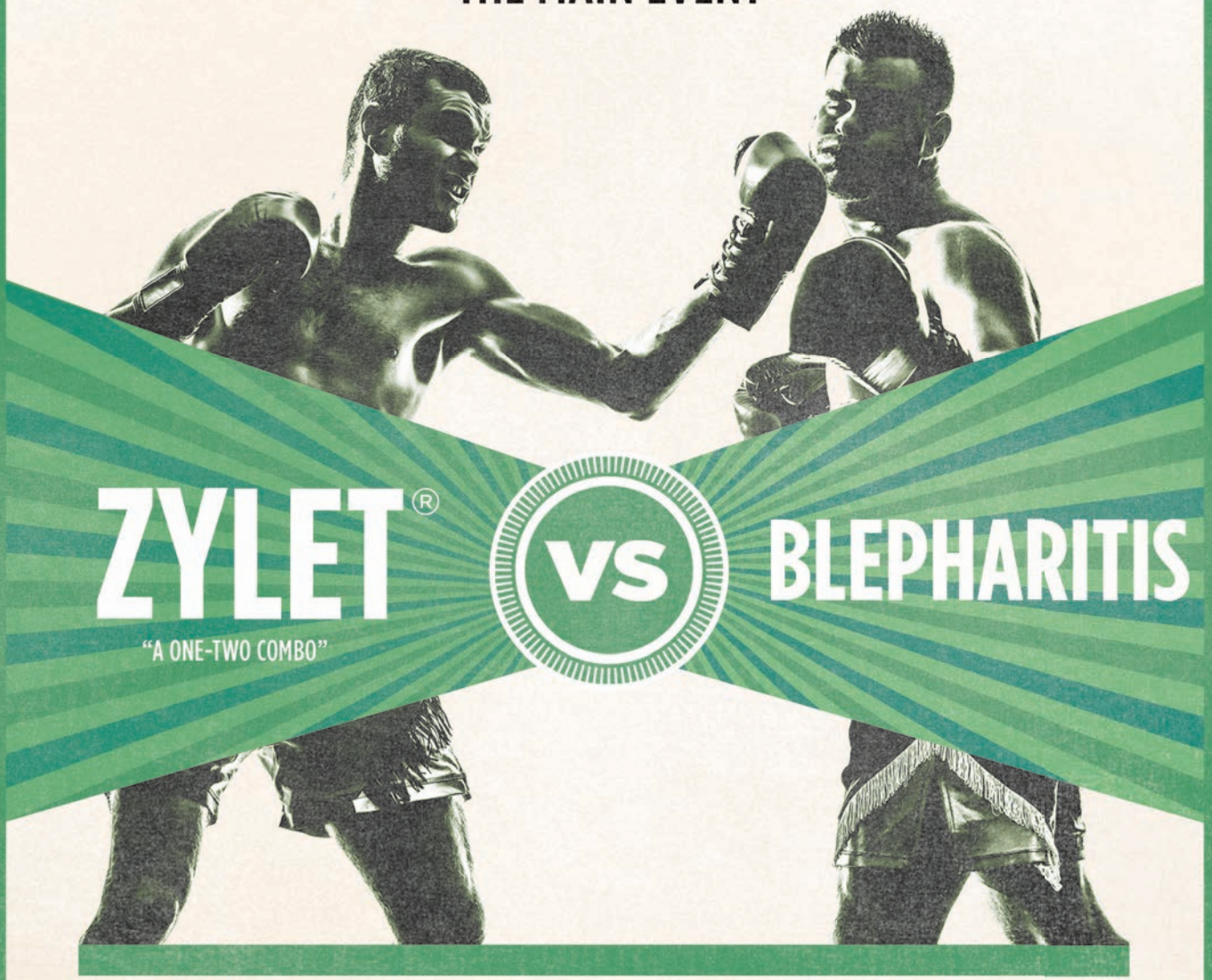
Still, some practitioners chafe at the perceived limitations of a word rooted in measurement. Back in 1940, there was a flash-in-the-pan movement afoot in the Midwest to change the profession's name from optometry to *ommatology* that clearly went nowhere.[9] And many optometrists in recent years have adopted the use of *optometric physician* to better reflect their involvement in the broader health care landscape.

Who knows, maybe the profession will eventually outgrow its title and be ready for another name change. The British optometrists of 1903 have some more good options to choose from—*Opticmatrician*? Or maybe *Licentiate in Optics?*

One thing is for sure: no matter what optometrists start calling themselves in the future, *Review of Optometry* will be there to spread the word. ■

1. Optometric Historical Society Newsletter. 1970.
2. Cox ME. Optometry, the Profession. Its Antecedents, Birth, and Development. Being a Series of Editorial Articles Appearing Under the Title "The Basis of Optometry's Public Relations" in Optical Journal and Review of Optometry from October 1, 1945 to January 1947. 1957.
3. Penisten D. Optometry's 100-Year Wars. Review of Optometry. January 1991.
4. "The Word 'Optometry.'" Optical Journal and Review of Optometry. July 11, 1938.
5. Jarvis JW. The formative days of optometry. Optical Journal-Review. January 15, 1941:28-29.
6. Haidopoulo GD. That word "optometry." Optical Journal-Review. June 15, 1938:46.
7. Hammon JH. Changing Methods of Practice. Optical Journal and Review of Optometry. January 15, 1941.
8. Brought to a Focus. Optical Journal and Review of Optometry. January 15, 1934.
9. "Ommatology" as the new "optometry." Optical Journal and Review of Optometry. July 1, 1940:32.

★ ★ ★ THE MAIN EVENT ★ ★ ★



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INDICATIONS AND USAGE

ZYLET® (loteprednol etabonate 0.5% and tobramycin 0.3% ophthalmic suspension) is a topical anti-infective and corticosteroid combination for steroid-responsive inflammatory ocular conditions for which a corticosteroid is indicated and where superficial bacterial ocular infection or a risk of bacterial ocular infection exists.

Please see additional Indications and Usage information on adjacent page, including list of indicated organisms.

INDICATIONS AND USAGE (continued)

Ocular steroids are indicated in inflammatory conditions of the palpebral and bulbar conjunctiva, cornea and anterior segment of the globe such as allergic conjunctivitis, acne rosacea, superficial punctate keratitis, herpes zoster keratitis, iritis, cyclitis, and where the inherent risk of steroid use in certain infective conjunctivitides is accepted to obtain a diminution in edema and inflammation. They are also indicated in chronic anterior uveitis and corneal injury from chemical, radiation or thermal burns, or penetration of foreign bodies.

The use of a combination drug with an anti-infective component is indicated where the risk of superficial ocular infection is high or where there is an expectation that potentially dangerous numbers of bacteria will be present in the eye.

The particular anti-infective drug in this product (tobramycin) is active against the following common bacterial eye pathogens: *Staphylococci*, including *S. aureus* and *S. epidermidis* (coagulase-positive and coagulase-negative), including penicillin-resistant strains. *Streptococci*, including some of the Group A-beta-hemolytic species, some nonhemolytic species, and some *Streptococcus pneumoniae*, *Pseudomonas aeruginosa, Escherichia coli, Klebsiella pneumoniae, Enterobacter aerogenes, Proteus mirabilis, Morganella morganii*, most *Proteus vulgaris* strains, *Haemophilus influenzae*, and *H. aegyptius, Moraxella lacunata, Acinetobacter calcoaceticus* and some *Neisseria* species.

IMPORTANT SAFETY INFORMATION

- ZYLET® is contraindicated in most viral diseases of the cornea and conjunctiva including epithelial herpes simplex keratitis (dendritic keratitis), vaccinia, and varicella, and also in mycobacterial infection of the eye and fungal diseases of ocular structures.
- Prolonged use of corticosteroids may result in glaucoma with damage to the optic nerve, defects in visual acuity and fields of vision. Steroids should be used with caution in the presence of glaucoma. If this product is used for 10 days or longer, intraocular pressure should be monitored.
- Use of corticosteroids may result in posterior subcapsular cataract formation.
- The use of steroids after cataract surgery may delay healing and increase the incidence of bleb formation. In those diseases causing thinning of the cornea or sclera, perforations have been known to occur with the use of topical steroids. The initial prescription and renewal of the medication order should be made by a physician only after examination of the patient with the aid of magnification such as a slit lamp biomicroscopy and, where appropriate, fluorescein staining.
- Prolonged use of corticosteroids may suppress the host response and thus increase the hazard of secondary ocular infections. In acute purulent conditions, steroids may mask infection or enhance existing infections. If signs and symptoms fail to improve after 2 days, the patient should be re-evaluated.
- Employment of corticosteroid medication in the treatment of patients with a history of herpes simplex requires great caution. Use of ocular steroids may prolong the course and exacerbate the severity of many viral infections of the eye (including herpes simplex).
- Fungal infections of the cornea are particularly prone to develop coincidentally with long-term local steroid application. Fungus invasion must be considered in any persistent corneal ulceration where a steroid has been used or is in use.
- Most common adverse reactions reported in patients were injection and superficial punctate keratitis, increased intraocular pressure, burning and stinging upon instillation.

Please see Brief Summary of Prescribing Information on the following page.

With a one-two combo in the treatment of blepharitis and other steroid-responsive ocular conditions with the risk of bacterial infection, PRESCRIBE ZYLET® TODAY.

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Zylet®
loteprednol etabonate 0.5% and tobramycin 0.3% ophthalmic suspension

BRIEF SUMMARY OF PRESCRIBING INFORMATION

This Brief Summary does not include all the information needed to use Zylet safely and effectively. See full prescribing information for Zylet.

Zylet® (loteprednol etabonate 0.5% and tobramycin 0.3% ophthalmic suspension)

Initial U.S. Approval: 2004

DOSAGE AND ADMINISTRATION

2.1 Recommended Dosing

Apply one or two drops of Zylet into the conjunctival sac of the affected eye every four to six hours. During the initial 24 to 48 hours, the dosing may be increased, to every one to two hours. Frequency should be decreased gradually as warranted by improvement in clinical signs. Care should be taken not to discontinue therapy prematurely.

2.2 Prescription Guideline

Not more than 20 mL should be prescribed initially and the prescription should not be refilled without further evaluation [*see Warnings and Precautions (5.3)*].

CONTRAINDICATIONS

4.1 Nonbacterial Etiology

Zylet, as with other steroid anti-infective ophthalmic combination drugs, is contraindicated in most viral diseases of the cornea and conjunctiva including epithelial herpes simplex keratitis (dendritic keratitis), vaccinia, and varicella, and also in mycobacterial infection of the eye and fungal diseases of ocular structures.

WARNINGS AND PRECAUTIONS

5.1 Intraocular Pressure (IOP) Increase

Prolonged use of corticosteroids may result in glaucoma with damage to the optic nerve, defects in visual acuity and fields of vision. Steroids should be used with caution in the presence of glaucoma.

If this product is used for 10 days or longer, intraocular pressure should be monitored.

5.2 Cataracts

Use of corticosteroids may result in posterior subcapsular cataract formation.

5.3 Delayed Healing

The use of steroids after cataract surgery may delay healing and increase the incidence of bleb formation. In those diseases causing thinning of the cornea or sclera, perforations have been known to occur with the use of topical steroids. The initial prescription and renewal of the medication order should be made by a physician only after examination of the patient with the aid of magnification such as a slit lamp biomicroscopy and, where appropriate, fluorescein staining.

5.4 Bacterial Infections

Prolonged use of corticosteroids may suppress the host response and thus increase the hazard of secondary ocular infections. In acute purulent conditions of the eye, steroids may mask infection or enhance existing infection. If signs and symptoms fail to improve after 2 days, the patient should be re-evaluated.

5.5 Viral Infections

Employment of a corticosteroid medication in the treatment of patients with a history of herpes simplex requires great caution. Use of ocular steroids may prolong the course and may exacerbate the severity of many viral infections of the eye (including herpes simplex).

5.6 Fungal Infections

Fungal infections of the cornea are particularly prone to develop coincidentally with long-term local steroid application. Fungus invasion must be considered in any persistent corneal ulceration where a steroid has been used or is in use. Fungal cultures should be taken when appropriate.

5.7 Aminoglycoside Hypersensitivity

Sensitivity to topically applied aminoglycosides may occur in some patients. If hypersensitivity develops with this product, discontinue use and institute appropriate therapy.

ADVERSE REACTIONS

Adverse reactions have occurred with steroid/anti-infective combination drugs which can be attributed to the steroid component, the anti-infective component, or the combination.

Zylet:

In a 42 day safety study comparing Zylet to placebo, ocular adverse reactions included injection (approximately 20%) and superficial punctate keratitis (approximately 15%). Increased intraocular pressure was reported in 10% (Zylet) and 4% (placebo) of subjects. Nine percent (9%) of Zylet subjects reported burning and stinging upon instillation.

Ocular reactions reported with an incidence less than 4% include vision disorders, discharge, itching, lacrimation disorder, photophobia, corneal deposits, ocular discomfort, eyelid disorder, and other unspecified eye disorders.

The incidence of non-ocular reactions reported in approximately 14% of subjects was headache; all other non-ocular reactions had an incidence of less than 5%.

Loteprednol etabonate ophthalmic suspension 0.2% - 0.5%:

Reactions associated with ophthalmic steroids include elevated intraocular pressure, which may be associated with infrequent optic nerve damage, visual acuity and field defects, posterior subcapsular cataract formation, delayed wound healing and secondary ocular infection from pathogens including herpes simplex, and perforation of the globe where there is thinning of the cornea or sclera.

In a summation of controlled, randomized studies of individuals treated for 28 days or longer with loteprednol etabonate, the incidence of significant elevation of intraocular pressure (≥10 mm Hg) was 2% (15/901) among patients receiving loteprednol etabonate, 7% (11/164) among patients receiving 1% prednisolone acetate and 0.5% (3/583) among patients receiving placebo.

Tobramycin ophthalmic solution 0.3%:

The most frequent adverse reactions to topical tobramycin are hypersensitivity and localized ocular toxicity, including lid itching and swelling and conjunctival erythema. These reactions occur in less than 4% of patients. Similar reactions may occur with the topical use of other aminoglycoside antibiotics.

Secondary Infection:

The development of secondary infection has occurred after use of combinations containing steroids and antimicrobials. Fungal infections of the cornea are particularly prone to develop coincidentally with long-term applications of steroids.

The possibility of fungal invasion must be considered in any persistent corneal ulceration where steroid treatment has been used.

Secondary bacterial ocular infection following suppression of host responses also occurs.

USE IN SPECIFIC POPULATIONS

8.1 Pregnancy

Teratogenic effects: Pregnancy Category C. Loteprednol etabonate has been shown to be embryotoxic (delayed ossification) and teratogenic (increased incidence of meningocele, abnormal left common carotid artery, and limb fixtures) when administered orally to rabbits during organogenesis at a dose of 3 mg/kg/day (35 times the maximum daily clinical dose), a dose which caused no maternal toxicity. The no-observed-effect-level (NOEL) for these effects was 0.5 mg/kg/day (6 times the maximum daily clinical dose). Oral treatment of rats during organogenesis resulted in teratogenicity (absent innominate artery at ≥5 mg/kg/day doses, and cleft palate and umbilical hernia at ≥50 mg/kg/day) and embryotoxicity (increased post-implantation losses at 100 mg/kg/day and decreased fetal body weight and skeletal ossification with ≥50 mg/kg/day). Treatment of rats at 0.5 mg/kg/day (6 times the maximum daily clinical dose) during organogenesis did not result in any reproductive toxicity. Loteprednol etabonate was maternally toxic (significantly reduced body weight gain during treatment) when administered to pregnant rats during organogenesis at doses of ≥5 mg/kg/day.

Oral exposure of female rats to 50 mg/kg/day of loteprednol etabonate from the start of the fetal period through the end of lactation, a maternally toxic treatment regimen (significantly decreased body weight gain), gave rise to decreased growth and survival and retarded development in the offspring during lactation; the NOEL for these effects was 5 mg/kg/day. Loteprednol etabonate had no effect on the duration of gestation or parturition when administered orally to pregnant rats at doses up to 50 mg/kg/day during the fetal period.

Reproductive studies have been performed in rats and rabbits with tobramycin at doses up to 100 mg/kg/day parenterally and have revealed no evidence of impaired fertility or harm to the fetus. There are no adequate and well controlled studies in pregnant women. Zylet should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

8.3 Nursing Mothers

It is not known whether topical ophthalmic administration of corticosteroids could result in sufficient systemic absorption to produce detectable quantities in human milk. Systemic steroids that appear in human milk could suppress growth, interfere with endogenous corticosteroid production, or cause other untoward effects. Caution should be exercised when Zylet is administered to a nursing woman.

8.4 Pediatric Use

Two trials were conducted to evaluate the safety and efficacy of Zylet® (loteprednol etabonate and tobramycin ophthalmic suspension) in pediatric subjects age zero to six years; one was in subjects with lid inflammation and the other was in subjects with blepharoconjunctivitis.

In the lid inflammation trial, Zylet with warm compresses did not demonstrate efficacy compared to vehicle with warm compresses. Patients received warm compress lid treatment plus Zylet or vehicle for 14 days. The majority of patients in both treatment groups showed reduced lid inflammation.

In the blepharoconjunctivitis trial, Zylet did not demonstrate efficacy compared to vehicle, loteprednol etabonate ophthalmic suspension, or tobramycin ophthalmic solution. There was no difference between treatment groups in mean change from baseline blepharoconjunctivitis score at Day 15.

There were no differences in safety assessments between the treatment groups in either trial.

8.5 Geriatric Use

No overall differences in safety and effectiveness have been observed between elderly and younger patients.

NONCLINICAL TOXICOLOGY

13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility

Long-term animal studies have not been conducted to evaluate the carcinogenic potential of loteprednol etabonate or tobramycin.

Loteprednol etabonate was not genotoxic *in vitro* in the Ames test, the mouse lymphoma TK assay, a chromosome aberration test in human lymphocytes, or in an *in vivo* mouse micronucleus assay.

Oral treatment of male and female rats at 50 mg/kg/day and 25 mg/kg/day of loteprednol etabonate, respectively, (500 and 250 times the maximum clinical dose, respectively) prior to and during mating did not impair fertility in either gender. No impairment of fertility was noted in studies of subcutaneous tobramycin in rats at 100 mg/kg/day (1700 times the maximum daily clinical dose).

PATIENT COUNSELING INFORMATION

This product is sterile when packaged. Patients should be advised not to allow the dropper tip to touch any surface, as this may contaminate the suspension. If pain develops, redness, itching or inflammation becomes aggravated, the patient should be advised to consult a physician. As with all ophthalmic preparations containing benzalkonium chloride, patients should be advised not to wear soft contact lenses when using Zylet.

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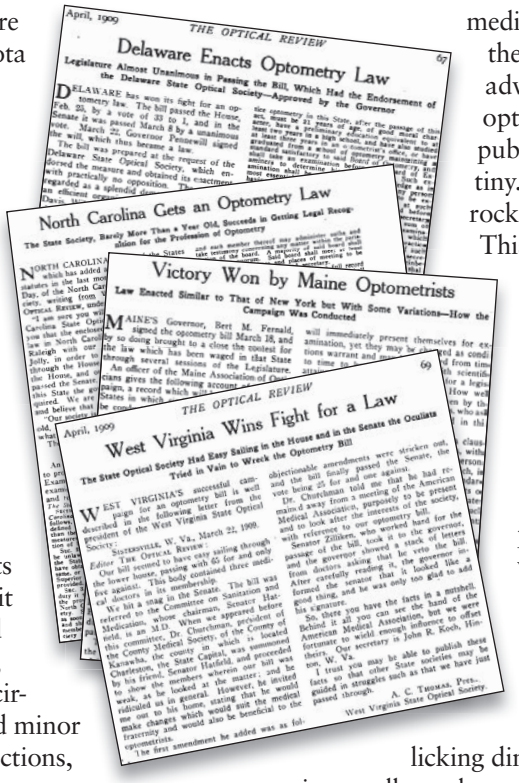
LEGALIZING OPTOMETRY

A behind-the-scenes look at the people, the moments and the legislation that made the profession what it is today.

BY BILL KEKEVIAN, SENIOR EDITOR

Optometry's first licensure law, passed in Minnesota in 1901, is emblematic of the profession itself. Not just because of the historical precedent it set, but because of how frequently it was challenged, restored, disavowed, reinstated and updated. The 1901 bill was rewritten in 1914, 1924 and as recently as 2008.[1] That's the story of optometry in a nutshell—a profession constantly redefining itself.


April, 1909 THE OPTICAL REVIEW 67

Delaware Enacts Optometry Law

Legislature Almost Unanimous in Passing the Bill, Which Had the Endorsement of the Delaware State Optical Society—Approved by the Governor

North Carolina Gets an Optometry Law

Victory Won by Maine Optometrists

Law Enacted Similar to That of New York but With Some Variations—How the Campaign Was Conducted

April, 1909 THE OPTICAL REVIEW 69

West Virginia Wins Fight for a Law

The State Optical Society Had Easy Sailing in the House and in the Senate the Ocultists Tried in Vain to Wreck the Optometry Bill

First, optometry fought tooth-and-nail to distinguish itself from medicine. Then, it fought medical disciplines from encroaching on its refraction work. Next, it insisted it was a medical discipline itself and that its practitioners were, in fact, doctors. Today, optometrists are circling the wagons around laser and minor surgical procedures as well as injections, so perhaps it's time for Minnesota to dust off that vintage 1901 bill for yet another update. Optometrists in Oklahoma, Kentucky and Louisiana already have their laser privileges.

In 1937, *Reader's Digest* put optometry "on trial" by challenging its clinical skills and professional ethics.[2] But, in a sense, optometry has always been on trial, and has had to fight to justify its existence to the medical establishment, the public and the law. Each time its champions advocate for expanded privileges, optometry returns to the court of public opinion and academic scrutiny. But it's learned to navigate the rocky, perilous waters of legislation.

This profession, it seems, attracts the underdog. It's got something to prove to its foes. Luckily, as Matt Garston, OD, of New England College of Optometry puts it, "They have to win every time out. We only have to win once."

This is the story of optometry's persistence in getting that "one win" that counts.

RECOGNITION: 1891-1923

In 1922, *The Optical Journal and Review of Optometry (OJRO)* reported on a "rollicking dinner, brightened by witty five-minute talks and snappy college yells by the students of the graduating class of the Pennsylvania State College of Optometry."[3] Among the speakers at this boisterous event was the school's founder, Albert Fitch, who must have already stood as a modern day folk hero to the boys sitting before him. Seven years earlier, Fitch led the charge to pursue legal action against a Pennsylvania judiciary and successfully bucked regulation when

optometry was deemed "a separate profession from medicine."

The *OJRO* article continues: "Albert Fitch aroused the enthusiasm of the diners when he expressed hope that the 1923 Legislature will give the college the right to grant degrees. Toastmaster Joseph Hagerty intensified their interest by stating that the law committee of the Philadelphia society had already started work on the plans for such a privilege.[3] You can almost hear the champagne glasses clinking. A year later, the first Doctor of Optometry graduates would turn their tassels and be handed that very degree.

But those first professional degrees were the culmination of work begun decades, not years, earlier.

Prentice's Fee

Optometry's first legislative battle would be hard won and take decades to accomplish. Its story starts with Charles F. Prentice of New York. Prentice authored the lead feature article in the very first issue of *Review's* predecessor, *The Optician* in 1891, a clinical piece entitled "A Metric System of Numbering and Measuring Prisms."[4] He had studied physics, optics and engineering in Germany and likely had more expertise in refraction than most ophthalmologists of his day.[4] A retrospective piece about him, published in 1969, recalls, "Prentice was a scrapper, almost to the point of ruthlessness. His determined nature and sense of superiority may not have won many friends for him within optometry, but his brilliance and doggedness compelled medical respect and helped to win the day for the nonmedical refractionists."[4]

Perhaps it was this scrappy attitude that led him to take a leap in 1895 and begin charging a fee for eye exams. At the time, the state of New York considered optometry separate from medicine, but an exam of the eye was itself considered a medical practice. The argument of the day was that optometry was a more serious evaluation of the health of the eye than was provided by a dispensing optician—who merely filled prescriptions—but did not include medical treatment and, therefore, should not be regulated as a medical practice.[5] It was a measurement, yes, but of the function of the eye.

Three years earlier, Prentice had tried to establish a legal precedent for refracting opticians in New York so that he could charge a fee for the service.[6] "In the early days, a lot of the activity took place in New York State," explains Ron Ferrucci, OD, current president of the Optometric Historical Society. "A lot of opticians there were doing quite well. They were serious and confident about their skills. They were gaining public acceptance and they finally felt that it was time to legitimize what they were doing in the face of what was becoming increasing criticism from medicine." Prentice faced challenges on one side from "physicians who wanted optometry to be regulated by the medical profession" and on the other side from "dispensing opticians who did not want refracting opticians to be in the business of dispensing eyeglasses."[6]

When Prentice charged the fee in violation of state regulation, essentially practicing medicine without a license, oculist Henry Noyes threatened him with jail time. But change was in the air. That same year, 1895, *The Optician* took on a new name—*The Optical Journal*—and established itself as the first optometric publication in the United States. In 1896, Prentice, still

PRENTICE AND THE OCULISTS

Charles Prentice, as he appeared in a 1941 *OJRO* article.

Believe it or not, Prentice started out as friends with Henry Noyes, MD, and D.B. St. John Roosa—both founders of the American Ophthalmological Society. They met while Prentice was at New York Eye and Ear Infirmary in the late 1880s.[1] Dr. Noyes even asked Prentice to present his system of prism measurements to a group of ophthalmologists.[1]

But in an 1892 letter, Dr. Noyes challenged Prentice's practice of charging a fee for an exam, calling it an "injustice to the public."[1] Prentice responded that he was as qualified as the "average rising oculist" and always sent disease suspects to a medical doctor. Noyes and Dr. Roosa became enraged at Prentice's hubris, and Roosa appealed to the New York County Medical Society to cut out optometrists altogether. However, Prentice had better sloganeering; his rallying cries framed the profession not as one of medicine, but of optics: "A lens is not a pill!"[2] Lapel pins and advertisements read, "Optometry is founded on optical science" and "A lens treats light. A lens does not treat disease." All these counteracted the oculists' argument and helped defeat bills relegating refraction to medical doctors in New York and Ohio in 1896.

1. Stevens R. American Medicine and the Public Interest. University of California Press. 1971. 103-8.
2. Lubell J. In Scope. AOA Focus. Nov./Dec. 2014:22-29. Accessed: www.aoa.org/news/aoa-focus/novemberdecember-2014/in-scope?sso=y

enraged at the threat against his freedom, issued a stern treatise on the reasons why states should recognize his profession. He also drafted a bill insisting the government recognize that "fitting glasses constituted the treatment of light, not disease and so did not infringe upon medicine's purview."[7]

Optometrists Unite

Two years later, Prentice would help launch the American Association of Opticians (forerunner of today's American Optometric Association) along with many like-minded thinkers, including *The Optician's* founder, Frederick Boger.[8] That year, chapters would open in 31 states.[6] They were an army on the rise. A rogue militia bucking established protocol. Fitch was among them. As were H.M. Hitchcock, Alexander Sweningson, C.A. Snell, J.W. Granger and F.A. Upham. They declared the first victory for optometry in 1901 when Minnesota "fell," and the domino effect soon began. By 1903, organized optometry took Illinois, following a lawsuit that declared, "the selling of spectacles and the treatment of defective vision are not part of the practice of medicine or surgery."[6] In 1915; Pennsylvania was on board (following *Marin v. Baldi*).[6,9] In 1917, the US Supreme Court handed down a decision in the *McNaughton v. Johnson* case, stating that states may regulate the practice of optometry through licensure.[6]

Just like that, Prentice had nearly won his revolution. Throughout the 1910s optometry bills were the talk of the trade. *Optician* pages from this era are littered with headlines such as "Victory Won By Maine Optometrists" or "Hearty Support of New Jersey Bill."

The Last Stand

A few hiccups remained; for instance, Texas dragged its feet in establishing an optometry act and, there, the question remained: Was optometry a medical practice? If declared as such, Texas could shut down every optometrist for lacking a medical license.

The AOA devised a plot to force the judicial system's hand.[10] In 1919, Fred Baker chose to be arrested for performing an eye exam and charging a fee. After years of lost time, money and aggravation, the case was eventually decided in his favor, and optometry was permitted in the state of Texas—the last state holding out against official adoption.[10]

ESTABLISHING ETHICS: 1924-1968

"During the first two decades of the 20th century, optometry was faced with the enormous challenge of transitioning from a trade to a profession," explains Dr. Ferrucci. "This required the establishment of standards and a scope of practice that was recognized and accepted by the public and was unassailable by opponents of optometry. The passage of state laws firmly establishing optometry as a legislated profession was the necessary way to achieve this aim, and all 48 states accepted this challenge with a fervor," he says.

The era saw an explosion in the development of optometric schools and formal bodies. By this point, each state had an optometric board. In 1925, the AOA formed the Council on Optometric Education (COE) to accredit optometric education institutions.[11] As a result of these waves of organization, optometric education flourished over the next decade.[11]

But the ethics of this hybrid of health services and commerce remained unsolved. How far into medical care should optometrists practice? Should they advertise? What services should be offered at a charge? These questions were on the lips of every optometrist in America and were pontificated upon throughout the pages of this publication, by then known as *The Optical Journal and Review of Optometry*.

Banishing Commercialism

1937 was a momentous year. Franklin Roosevelt had just won re-election in a landslide. (Four years earlier, an illustration of the bespectacled president himself graced the *OJRO* cover). In Germany, Hitler was secretly plotting the blitzkrieg—perhaps while wearing a pair of reading glasses that he kept so secret, he was rumored to have personally destroyed any photographic evidence of having worn. In Pennsylvania, Fitch was angling—nearly with success—to expand optometry's scope to include diagnostic and therapeutic pharmaceuticals, a privilege most optometrists wouldn't experience for more than three decades.[12]

In an address published in *The Optical Journal-Review*, AOA president Harry Pine, DOS, drew a line in the sand over the divide between the groups he calls "commercial optometrists" and "professional optometrists."[13] He set the tone with a stern warning to "remove any semblance of commercialism from their places of practice, to have them conform to the highest type of professional practice."[13] Dr. Pine lamented that "during this past year, the professional practice of optometry has been assailed and has been obliged to protect itself against onslaughts waged by those who would destroy optometry as a profession."[13]

No sooner had Dr. Pine railed against the charlatans

within optometry than a devastating article appeared in *Reader's Digest*, "Optometry on Trial," labeling optometry a sham.[2] The article uses some similar language, claiming "optometry has endeavored in the legislatures and in the courts, to stamp out 'corporate practice' and often the corporations have won." In the pages of *ORJO*, the AOA shot back: "This article contained many untruths and half-truths about the profession."[13] Responses to the article took up more than a dozen pages in *The Optical Journal and Review*. It was clear optometry suddenly had a huge PR problem.

State laws were already beginning to address this issue. For instance, Michigan amended its law in July 1937 to prohibit "canvassing neighborhoods or soliciting at businesses for the purposes of selling glasses, eye examinations and other optometric services," as well as "practicing 'price advertising' for eyeware (glasses, lenses, frames) or optometric services.[14] Steps like these helped legitimize optometry, but, on December 7, 1941, an earth-shattering tragedy would give American optometry the opportunity to serve the country and prove its worth.

***OJRO*, its advertisers and the optometry field joined in the WWII effort. The war would give optometrists the opportunity to prove their profession's value, both in the service and, later, in Veterans Administration hospitals.**

In Times of War

In 1942, H.C. Roberts, OD, wrote in *The Optical Journal and Review*, "Someone has aptly said, 'Optometry began behind the jeweler's counter, but it will fulfill its destiny upstairs in a white coat.' This prediction appears to be coming true."[15]

The 1940s represented a decade in which optometry began to shore up its numbers in both education and representation. In 1930, the Council on Optometric Education had already established academic standards for the profession, but in 1941 the Association of Schools and Colleges of Optometry, with Albert Fitch again at the helm as its first president, unified the optometric education leaders. "The Association of Schools and Colleges came on board to unify the optometric education leaders," says Dr. Ferrucci. "As the educational process continued, optometry became somewhat frustrated that they weren't able to practice at the limit of their education."

When the United States entered World War II, optometrists played their role in the effort. In a May 15, 1943 issue of *OJRO*, AOA president Ewing Adams, OD, wrote "In time of war, optometry has a special skill which is needed by the armed forces and industrial workers."[16] In 1944 the AOA attempted, but initially failed, to establish an "optometry corps" in the military.[9] However, by 1947, optometrists were commissioned in the Army and placed on the staff of Veterans Administration (VA) hospitals.[9] These two appointments not only offered optometrists the opportunity to serve their country, but to apply the full extent of their knowledge. The Army and the VA were perfect testing grounds, as treating these patients with greater privileges wasn't constrained by state statutes.

Following the war, "the GI Bill allowed a number of intelligent, mature, career-minded individuals to enter the profession. Many worked in the medical corps and did many more things as servicemen than they were allowed to do in the practice of optometry at the time," explains Dr. Ferrucci. "So, in the '50s, there was a struggle as to where we wanted to go. Did we want to remain a non-medical refracting profession, or did we want to embrace the fact that our education is improving and that we should be doing more for the public welfare? Although there were some rumblings by some that we should move toward 'the medical model,' the profession as a whole wouldn't be ready to move in that direction for at least another decade."

Expanding Practice

Always bubbling under the surface was resentment—and attempted sabotage and skullduggery—from the medical establishment. "The 1950s, in my view, is a particularly turbulent time because the profession was conflicted," says Dr. Ferrucci.

"There was a very famous meeting in Seattle in 1954 where optometrists said, 'the field of refraction belongs

totally to optometry and any other entity who tries to practice this is practicing optometry without a license.' Medical took umbrage at that, saying, 'You're telling us that we medical doctors are not allowed to do refractions?' So, medicine retaliated, which harmed the interprofessional relations for a time," he adds.

In Massachusetts, Dr. Garston was one of the young doctors embroiled in some of those very conflicts. In the 1950s and 1960s, "if people would come in with problems, we were only allowed to try to help them with either glasses or contact lenses, and if their vision was still not quite right, we really couldn't look well enough to really understand what the problem was," Dr. Garston says. "So, the atmosphere was one of frustration, I think, because we had to refer these cases to ophthalmologists."

Even so, the field was booming. With acceptance by the VA and an influx of new doctors opening optometric businesses around the country, optometrists must have felt for the first time that they were on a winning streak. But two major blows in the 1960s would remind them their fight was far from over. First, the AOA—hoodwinked by ophthalmology—voted not to be included under Medicare, which would haunt optometrists for years as they lost patients to ophthalmologists. Second, they still lacked the legal right to perform a variety of basic tests, including applying diagnostic drops. "It was felt we should have more of an ability to look inside the eye and to check the pressure of the eye with both dilating and anesthetic drops," says Dr. Garston.

At this time, an optometrist practicing in a VA facility enjoyed a variety of clinical privileges, but as soon as he stepped outside, he would be relatively powerless to perform those same procedures. Outside, the optometrist could merely "detect" disease and then refer it out to an ophthalmologist for an actual diagnosis. In 1961, optometrists in Pennsylvania introduced a bill that would allow ODs the use of diagnostic pharmaceutical agents (DPAs). But the bill never even came to the floor and it would take another decade before optometrists were granted this privilege.[9] Mydriasis-inducing formulations started to creep into optometry from the educational side and from health systems that operated outside of state laws, such as VA hospitals. So, a few were able to use them and started to see not just the benefit, but the need for their use.

"In 1968, I was hired by the college here in Massachusetts and then I was asked to go to the public health hospital in 1969 and that's where I was asked to use the drugs," explains Dr. Garston. "It was like before we were looking into a room through the keyhole versus—with the drops—opening the door and doing a better exam. It was a big thing," he says. "Formerly, we couldn't tell what the patient's problem was or what to do about it, so we would just send the patient to the ophthalmologist and usually, they didn't send them back. It was a one-way street—very frustrating."

Of course, the medical establishment fought Dr. Garston every step of the way, legally and psychologically. The first time he applied diagnostic drops, he says, he stood on guard ready to catch his patient if he collapsed. "Ophthalmologists were saying these drugs were dangerous and patients could die," he relates.

His experience was reflected across America—and optometry wasn't going to take it lying down.

REVOLUTION: 1968-1998

Like the American Revolution, the optometric revolution was launched by a small team of co-conspirators. The insurgents sought to address "rumblings and discontent among the younger optometrists who were dissatisfied with the imbalance between the scope of responsibility and educational preparation."[17] By then, "the frustration in the profession was festering and it was coming to a head," says Dr. Ferrucci. "I think some of these forceful leaders were coming together and said 'it's time now, to take the bull by the horns.'

Key players included Drs. William Baldwin, Irvin Borish, Milton Eger, Sprugeon Eure, Alden Norman Haffner, William Hazlett, Gordon Heath, Norman Wallis and others.[18] This team sought to address the frustrations of the '50s and '60s by establishing optometry's role, making a concerted effort to be recognized for that role and elevate the profession altogether. The momentous 1968 event—held in an airport hotel adjacent to La Guardia airport in New York—would come to be known as "The La Guardia Conference."[18]

The Triumph of DPA legislation

It was at La Guardia that optometry first planted a flag in the ground. In his address to the group, Dr. Haffner declared, "the optometrist is a primary care provider and the optometrist has a role in the diagnosis and treatment of ocular pathology." He rejected the idea that this encroached on medicine, saying, "the experience of dentistry and podiatry disclaims that argument emphatically. Ophthalmology may well ask the question of the future of its own discipline. It seems to me that the medical and surgical skills of ophthalmology

"Please, Call me Doctor"

By Irving Bennett, OD

Twenty-five years ago, in 1991, there were relatively few female optometrists in the United States, and female ODs in leadership roles were even scarcer. So it was quite a surprise when Nancy Wiggins, OD, a young partner in a busy practice in Aliquippa, Pa., became the editor of a weekly eye care column in the daily *Beaver County Times*.

The column enjoyed a good degree of popularity, and it certainly boosted her practice when the byline read Dr. Nancy Wiggins. But when the *Times* got a new editor and publisher, things changed. Dr. Wiggins was told that henceforth she could not use the "Dr." title with her column since she was not a medical doctor. That ended the column, but Dr. Wiggins did not relent.

When I heard about the *Times'* policy, I met with Alan Buncher, the publisher, to learn more. I had been active in civic activities in Beaver County for decades; my name was in the paper all the time and I was always referred to as "Dr." The meeting was cordial but non-productive; he politely explained that the Associated Press Style Book specifically said that the Dr. title was reserved for medical doctors or (in some cases) PhDs. That's that.

I soon learned the AOA was already negotiating this issue with the *St. Louis Post Dispatch* and the Associated Press. The AOA's efforts led to the AP Style Book amendment that gave publishers the choice to list optometrists, and other non-MD professionals with doctorate degrees, if they wished. Mr. Buncher called to tell me the local paper would now list optometrists as doctors.

April, 1909 THE OPTICAL REVIEW 83

New York Society Acts on Use of Titles

Members Required to Call Themselves Optometrists—Proposed Amendment Prohibiting the Use of "Doctor" in Signatures and Printed Matter

IN the lecture room of the Engineer Societies building, 29 W. 39th St., the monthly meeting of the Optometrical Society of the City of New York was held March 10, with President Albert Cohen in the chair and James H. Drakeford performing his duties as secretary.

It was decided to ballot upon the applications

cards in accordance with Mr. Arrington's suggestion.

The committee was empowered to employ legal counsel whenever it seems necessary in order to assist in obtaining a proper enforcement of the new optometry law.

The secretary was directed to send congratu-

The word "doctor" comes from Latin and is synonymous with "teacher." It had been usurped by medicine years ago, and its use went unquestioned. It was not until 1923, when PCO founder and president Albert Fitch single-handedly arranged for a bill to be introduced in the Pennsylvania Legislature to permit PCO to award the Doctorate of Optometry degree to its graduates.

The bill was met with skepticism, and many optometrists expected it to be summarily defeated. They also feared retaliation from the medical profession and educators. Surprisingly, there was no opposition from either educational or medical circles, and Pennsylvania welcomed the first US law legalizing the OD degree.

Organized medicine did not oppose the effort because, as Fitch tells it in his autobiography, medicine was proposing legislation in Pennsylvania that would amend the Optometry Act to require that a candidate for examination for licensure in optometry be "a graduate of a school or college of medicine and surgery." Medicine was confident that this proposal would be adopted, eliminating optometry as a profession. Thankfully, the bill never was passed!

Over the years, ophthalmology branded optometry by defining it for what it was not instead of what it is. The phrase, "optometrists are not medical doctors," got widespread distribution and even today it is sometimes still used to define optometry.

A 1969 controversy stemming from a "60 Minutes" story about the Cyrus Bass lawsuit against the AMA highlights how the media perpetuated this branding. Dr. Jack Runninger wrote to CBS complaining about the unfair reference in the "60 Minutes" story defining optometry. Nationally-recognized journalist Andy Rooney responded in part, "I must disagree with you about use of the word 'doctor.' There are no legal restrictions to its use, but the word has gained its stature from its association with the medical profession [...] (optometrists) are intentionally borrowing some of the meaning which the medical profession has given the word and are therefore being just the tiniest bit deceptive."

Today, however, everyone accepts optometrists as doctors just as they accept dentists and podiatrists—thanks to the to the AOA and the dedication of stalwart optometrists of yesteryear.

might be turned to include the other critically needed special talents in neurology, neuro-ophthalmology and internal ocular surgery."[18]

From this meeting came three primary conclusions about advancing the profession. First, optometry must abandon its self-image as a drugless profession. Second, optometrists must take a tip from medicine and continuously update their education to elevate the profession, in the public's eye, to that of a primary care provider. And third, just as Prentice had done at the turn of the century, they must organize to update optometric legislation. Later meetings would bolster the decisions made on this day, such as the Airlie House Conference held in Warrington, VA, in February 1969, where ODs laid out specifics on how to enact diagnostic pharmaceutical agent (DPA) legislation.[19]

Following La Guardia, Dr. Haffner and others took the message near and far. It showed up, delivered by Dr. Haffner himself, on the doorstep of Rhode Island optometrist Morton Silverman.[18]

Dr. Silverman "was instrumental in getting the Rhode Island legislation passed," says Dr. Garston. The legislation he's referring to is the country's first DPA act in 1971. At the Airlie House conference, attendees toyed with the ideas of submitting 50 bills simultaneously, but the Ocean State wasn't keen on waiting.[17]

Optometric leaders flew in to the La Guardia airport, seen here in the 1970s, to meet at a nearby hotel. The meeting launched the profession's efforts to aquire diagnostic drug privileges.

"That La Guardia conference began the impetus for Rhode Island to become the first state to enact a DPA act in 1971. I like to think of the DPA bill in Rhode Island as 'the Boston Tea Party,'" says Dr. Ferrucci.

Rhode Island established that optometrists could apply diagnostics as long as they had the educational credentials to do so. This opened up an opportunity for Dr. Garston. Because he had already developed a few years of experience with diagnostic drops and related instrumentation, they used him as a consultant. There was a provision in the law in Rhode Island, and every state copied this when they passed their bills.

"Since the ophthalmologists were saying we weren't trained, we had to demonstrate that we could be trained and were being trained, so the training was given to every optometrist who wanted diagnostic and therapeutic capabilities," Dr. Garston recalls. "So, I would go, for example, to Maine with other optometrists that I had trained, and presented local, hands-on courses on how to use the drugs. Once you dilate, there are more instruments you can use to examine the back of the eye. So, that's what I did, along with others, in Maine, Rhode Island, Massachusetts and Pennsylvania. We physically trained the optometrists on how to use these agents to meet the provision in the law. This way, medicine could no longer claim we weren't trained."

This expansion not only changed what optometry was, but it changed what was printed between the covers of *OJRO*. Every issue throughout the '70s featured news of the latest challenges and victories in DPA legislation. "While a growing number of states are considering the loosening of restrictions on the use of diagnostic drugs, the passage of the Oregon bill affecting some 340 optometrists boosts to four the number of states which already allow optometric use of such drugs," reads a July 1975 issue.[20]

DPA passage was just one front in this era's legislative battles. Congress passed a law establishing optometry services within the VA's Department of Medicine and Surgery in 1976.[9] "This was really a milestone," says Dr. Ferrucci. "Optometrists were given vastly expanded clinical privileges. When optometrists in that system proved that they could perform competently advanced procedures, this became an impetus for the states to go to their legislatures and say, 'the federal government allows optometrists in the military and in the VA to use all of these clinical privileges to the advantage of their patients, why can't we?'"

While Dr. Garston and others were preparing ODs for DPA laws, a companion privilege, therapeutic pharmaceutical agent (TPA) laws, were coming into their own, too. At a January 1975 AOA Future Conference meeting in Tucson, Ariz., a team of optometric leaders pegged TPAs as their next target.[18] And when the opportunity arouse, Drs. Dave Janney and John Casto won those victories. "These two rolled up their sleeves in 1976 to get the first optometric TPA bill enacted in West Virginia."[17]

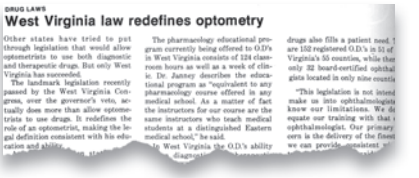
By the time dilation could be performed anywhere and TPA laws were steadily coming online, *Review of Optometry* was already asking—on its September 1989 cover—"Is optometry ready for laser surgery?"

A Shift Toward Comprehensive Care

By the mid-1970s, optometrists no longer identified with Charles Prentice's cry "a lens is not a pill." In a 1976 *Review of Optometry* article, Vincent Lupica, OD, wrote "the profession has undergone a considerable metamorphosis, emerging today as a provider of comprehensive eye care."[22]

But it still didn't have all the legislative tools it needed. For example, in 1981, just as David Cockrell, OD, was preparing to enter the field, he realized legislative restrictions might squash a dream he had studied years to obtain.

"Around the time I was finishing school, I learned there were certain things I was being trained to do that I wasn't able to do legally." he says. "That's when I learned, from some very astute leaders in Okla-


DRUG LAWS

West Virginia law redefines optometry

Other states have tried to put through legislation that would allow optometrists to use both diagnostic and therapeutic drugs. But only West Virginia has succeeded.

The landmark legislation recently passed by the West Virginia Congress, over the governor's veto, actually does more than allow optometrists to use drugs. It redefines the role of an optometrist, making the legal definition consistent with his education and ability.

The pharmacology educational program currently being offered to O.D's in West Virginia consists of 124 classroom hours as well as a week of clinic. Dr. Janney describes the educational program as "equivalent to any pharmacology course offered in any medical school. As a matter of fact the instructors for our course are the same instructors who teach medical students at a distinguished Eastern medical school," he said.

In West Virginia the O.D.'s ability

drugs also fills a patient need. T are 152 registered O.D.'s in 55 c Virginia's 55 counties, while tha only 32 board-certified ophtha giats located in only nine counti

"This legislation is not intend make us into ophthalmologists know our limitations. We d equate our training with that ophthalmologist. Our primary cern is the delivery of the finest we can provide—consistent w

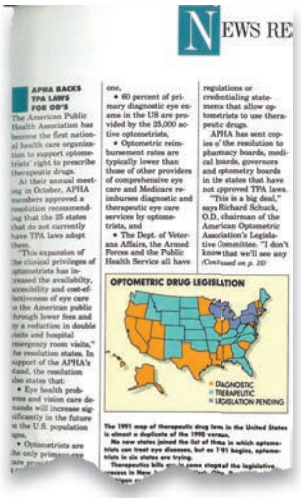
This 1976 *Review* headline was a harbinger of the legislative changes that elevated optometry.

homa optometry, that you have to get involved politically if you want to create legislative changes."

In Oklahoma, where Dr. Cockrell practices, medicine came after optometrists for using laser treatments. "Oklahoma's optometric statute stated that optometrists could treat 'ocular abnormalities by any means.' When laser procedures were introduced into eye care in the 1980s, ODs in Oklahoma were trained by the same people to do the same procedures at the same time as practicing ophthalmologists," he argues.

Medicine challenged and, for a time, won. But, in 1997, Dr. Cockrell testified in support of legislation to reinstate Oklahoma optometrists' laser privileges after those privileges were suspended the year before due to litigation initiated by ophthalmology.

In 1990, the American Public Health Association supported ODs in their fight for therapeutic drug privleges, a huge boon. "Optometrists are located in most all communities; ophthalmic surgeons are more urbanly located," explains Randall Thomas, OD. "Allowing any patient to be properly cared for without having to be referred to another doctor, is a win for patients."


NEWS RE

APHA BACKS TPA LAWS FOR OD'S

OPTOMETRIC DRUG LEGISLATION

DIAGNOSTIC
THERAPEUTIC
LEGISLATION PENDING

Redefining Optometry

After a series of successes in the first part of the century, optometric legislation faltered when, in the 1950s and '60s, it wasn't able to keep pace with optometric education. After a successful run of DPA and TPA laws throughout the '70s, optometrists weren't about to drop the ball again. "The momentum became unstoppable," says Dr. Ferrucci. The pattern had been established. Legislators seemed amenable to the idea that if the training was available in optometry schools, it should be available in practice.

In 1982, the AOA established an ad hoc Long-Range Planning Committee. "This blue-ribbon committee met frequently over a two and a half year period and consisted of past AOA presidents and such optometric luminaries as Irvin Borish, OD, and Irving Bennett, OD. The committee was charged with the task of setting the direction of optometry for the foreseeable future," says Dr. Ferrucci. "As a past president of AOSA, I was to represent the opinion of the younger generation of optometrists. As a member of the committee, I contributed to the wording of what became the new official definition of an optometrist. This landmark definition clearly established that optometrists were primary health care professionals with the ability to prevent, diagnose, treat and manage diseases and disorders of the visual system, the eye and its adnexa. It also made clear that optometrists had the knowledge to identify systemic disorders that had correlations to the eye and vision."

One of those amenable legislators was US Senator Barbara Mikulski—then a congresswoman—who, in 1986, "was the spearhead for getting optometry included in Medicare," says Dr. Ferrucci. Although some services, such as prescribing and fitting aphakic lenses, were available under Medicare since 1973, routine eye examinations remained prohibited, even though 95% of Americans who qualified had vision correction problems.[23] "That was the impetus for us to really have the legitimacy if you will, to gain access to other managed healthcare plans. We owe her a lot."

Here and there, optometrists showed they still exhibited the firebrand gene inherited from Charles Prentice. In 1989, *Review of Optometry* pondered aloud whether using civil disobedience was effective, retelling the tale of an Arizona doctor who, like Prentice, flouted the law and prescribed drugs to a patient who would otherwise have to drive 135 miles to an ophthalmologists.[24] Tales of patient inconvenience were proving to be one of optometry's most effective rhetorical tools. "Seventeen percent of our national panelists who treat are not licensed to do so," the article reads. "There's nothing wrong with refusing to abide by laws you feel are unjust, so long as you are willing to accept the consequences."[24]

Passing Legislation: A Personal Matter

Dr. Cockrell attributes his state's success on personal advocacy. "Legislation does not get passed on merit," he says. "Legislation is passed when you personally educate your legislator on the clear need for legislation and how it will help the citizens. Building personal relationships with legislators provides the opportunity to educate them on the need for legislation and how it will benefit their constituents." The broad development of these relationships allows for a "grassroots" strategy where all ODs who desire to pass the legislation can act together to achieve the goal.

Optometry honed those skills so finely that, in 1991, after Utah became the 26th state to adopt TPA legislation, *Review of Optometry* was running headlines like "O.D.s Expect New Wave of TPA Laws." Legislation progressing the scope of practice was no longer something optometrists hoped for; it was becoming expected.

The aforementioned doctor who disobeyed Arizona law would no longer be in violation of the law by 1993 and, when TPA legislation passed in the last holdout—Washington, DC—in 1998, no OD in the country would be.

AN EYE ON THE FUTURE: 1998-2016

For decades, optometry battled medicine. Ophthalmology groups, the American Medical Association and others sought to prevent ODs from practicing to the full extent of their education. But while optometry took every threat from these groups seriously, a different kind adversary was gaining strength and influence.

"In 1998, Pennsylvania passed its first TPA law. That allowed us to treat conditions such as bacterial infections. With the passage of legislation I now had the statutory authority to write a prescription and treat the patient, but I was not allowed to be a provider on the medical insurance panel. Therefore, I could not be reimbursed for my professional services," says Greg Caldwell, OD, past president of the Pennsylvania Optometric Association. Even though Dr. Caldwell's education and state legislature gave him the ability to prescribe, insurance companies were slow to follow suit. It was time for optometrists to organize again.

"I spent time making visits to these medical insurance payers, explaining to them what optometrists can diagnose and treat and, advocating for equal reimbursement for those services," says Dr. Caldwell. "The payers would ask 'why are you contacts-and-glasses guys here wanting to get reimbursed for treating glaucoma?' Those questions allowed me to educate the payers that optometrists have the training and expertise to diagnose, manage and treat many ocular conditions including glaucoma."

Again, every state had optometrists knocking on insurer's doors, calling them. In *Review*, editorials and news articles speculated about how optometrists would get a fair shake. "When we talk about 'access to patients,' there are really two fronts: One, can we do it, through legislation in our optometric practice acts, and, two, through being a provider of the patient's medical insurance," he says.

Forefront of Change

Meanwhile, Oklahoma, Kentucky and Louisiana had all embraced a scope of practice approach that ended up affording them the broadest privileges in the country. The scope laws from these states are so broad because, rather than tacking on a new approval for each privilege, they simply defined what optometrists can't do, Dr. Cockrell explains. These open-ended "exclusionary laws," as they came to be known, got their inspiration from medicine, which is not bound by such descriptive statutes. "In 2005, we passed a law that literally excluded the things we couldn't do—such as cataracts and retinal surgery—so that anything else that's not excluded is automatically included."

"One of the biggest challenges faced by optometry when passing legislation is that, frequently, medicine attempts to define our education to what we were taught in optometry school and ignore or downplay the quality of our continuing education system," says Dr. Cockrell. "However, what the legislator may not realize is that MDs and ODs both must continue their education after they finish school."

Now, when optometrists see health care legislation in the pipeline, they remember their long history fighting for recognition. Predicting they might be left out, they now preemptively make their voices heard. For instance, when Medicare launched physician quality reporting regulations (in 2007) and EHR Meaningful Use rules in 2009, Dr. Caldwell says, AOA members fought for optometry's inclusion.

"A critical point is that medical doctors typically have a greater influence in the policy arena, due to their long-standing involvement," he says. "We always say, 'if you're not at the table, you're on the menu.'"

When President Obama's sweeping health care reform bill, The Patient Protection and Affordable Care Act, was signed into law on March 23, 2010, optometrists were not fully included at the legislation's inception. Through individual optometrists, as well as state and national associations, optometry was certain to get a say in the matter. The Harken Amendment (named after its champion, Sen. Tom Harkin) made sure health plans wouldn't discriminate against optometrists. As usual, *Review* stood beside optometrists to help them navigate through the minutia of the 2,000-plus page law.[25,26]

Securing a Legacy

Optometry isn't a profession for people easily satisfied. Its history is replete with mavericks, self-starters

and independents. Every state and every era has had a Charles Prentice or a Norman Haffner or a Lou Catania or a Matt Garston who refused to be satisfied with the boundaries set before them. They inherited Albert Fitch's restless drive. Dr. Fitch died in 1960, before any TPA or DPA laws came to pass and before 23 schools across America offered Doctor of Optometry degrees. But he would be proud to see the progress optometry has made, the battles won, to ensure ODs can treat serious eye diseases to the full extent of their education.

"The credit, at the end of the day, goes to organized optometry," says Dr. Cockrell. "The coordinated efforts of the associations and individual optometrists move the profession forward. Legislative advances are never made by one or two people. Successful passage and implementation is only possible by organized optometry." ■

1. Passut J. Standardization plays pivotal role in Minnesota law. Primary Care Optometry News. July 2008. Accessed: May 3, 2016. http://www.healio.com/optometry/regulatory-legislative/news/print/primary-care-optometry-news/%7B8fdcbb0a-3178-49d7-b070-303629f26fea%7D/standardization-plays-pivotal-role-in-minnesota-law
2. Riis RW. Optometry on Trial. Reader's Digest. 1937;31(184):77-96.
3. Students and Faculty of Pennsylvania College entertained by Philadelphia society. Opt. J.-Rev. Optom. 1922;59(11):34.
4. Cox M. The Passing Scene in Optometry and Optics—a 50-Year Review. Opt. J.-Rev Optom. 1969;106(1):29-37.
5. Tahran RL, Borish IM. A review of events leading to the development of modern optometry in the United States. Hindsight: The Journal of Optometry History. 2012;43(2):28-34.
6. Eap SH. Optometry Law. 2012. Outskirts Press, Inc. 3-6.
7. Visionaries: hail to the father of optometry. Review of Optometry. 1991;128(2):9.
8. Visionaries: A salute to optometry's catalyst. Review of Optometry. 1991;128(1):10.
9. Optometry History Timelines. AOA. http://www.aoa.org/about-the-aoa/archives-and-museum/optometry-history-timeline?sso=y
10. Bennett I. Optometrist jailed for charging exam fee. Optometry Cares – The AOA Foundation. http://www.aoafoundation.org/ohs/hindsight/optometrist-jailed-for-charging-an-exam-fee/.
11. Register S. A backward glance on optometric education: Institutional profile of schools and colleges of optometry. Optometric Education. 2011;36(2):76-81.
12. Bennet I. Improving the scope of practice for optometry. Optometry Cares – AOA Foundation. www.aoafoundation.org/ohs/hindsight/improving-the-scope-of-practice-for-optometry/
13. Pine H. The President's Report. Opt. J.-Rev. Optom. 1937;74(15):18-19.
14. Michigan Optometric Association. MOA History: MOA Chronicles. http://www.themoa.org/aws/MOA/pt/sp/about_history
15. Roberts HC. Optometry's upward climb. Opt. J.-Rev. Optom. 1942;79(17):22-33.
16. Adams E. The President's Report. Opt. J.-Rev. Optom. 1943;80(10):??
17. Primary Care Optometry News. Contact lenses, prescribing privileges were major milestones in optometry's evolution March 1997. http://www.healio.com/optometry/primary-care-optometry/news/print/primary-care-optometry-news/%7B207e639a-2318-458c-be2e-9bc43ae236c9%7D/contact-lenses-prescribing-privileges-were-major-milestones-in-optometrys-evolution.
18. Haffner A. The La Guardia conference—the meeting that changed the profession. Hindsight: The Journal of Optometry History. 2010;41(1):17-20.
19. Eger M. The Airlie House Conference. Journal of the American Optometric Association. 1969:40(4):429-31.
20. Oregon governor signs drug measure into law. Opt. J.-Rev. Optom. 1975;112(14):11.
21. Kirkner R. Time to Call Up The New Guard. Review of Optometry. 2002;139(1);21.
22. Lupica V. Expansion of the scope of optometry. Opt. J.-Rev. Optom. 1976;113(2):53.
23. Health Care Legislation. Opt. J.-Rev. Optom. 1973;110(2):59.
24. Herrin S. Should O.D.s practice civil disobedience? Review of Optometry. 1989;126(1):19.
25. How Will Health Reform Help O.D.s? Review of Optometry. 2010;147(4):6.
26. Clarifications on Health Care Reform. Review of Optometry. 2010;147(5):8.

PATIENT AND PRACTICE SUCCESS
OFFERING ONE-OF-A-KIND TECHNOLOGY

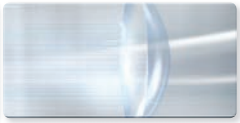
Steven I. Bennett, OD, FAAO
Bennett Optometry, Ann Arbor, MI

As an avid cyclist, I know that there are several factors that make all the difference in the quality of my ride. A high-quality bike is important for a safe and smooth journey, but equally critical are the fittings I make to the bike to adjust for my body. When the fittings are right, I feel completely comfortable in the seat and can focus on the joy of cycling. I have the same goal for my patients who wear contact lenses. The lenses should first address their unique ocular needs, but at the end of the day I want their contact lens experience to be effortless, as if they weren't even wearing contact lenses. I've found the perfect fit for my patients, and for my practice, with DAILIES TOTAL1® contact lenses.

I am pleased to report that studies of DAILIES TOTAL1® contact lenses have confirmed what my patients have been telling me about the outstanding moisture and comfort of these lenses and how these lenses have improved their lives. For example, one study found that the lubricity of DAILIES TOTAL1® lenses is the same at insertion as it is 16 hours later, at the end of a typical lens-wearing day.[5] The value of DAILIES TOTAL1® to patients is also reflected in an Alcon survey of contact lens wearers, in which nearly 90% of respondents said that DAILIES TOTAL1® contacts lenses were so comfortable they sometimes forgot they were wearing them.[6] In addition, almost 80% of contact lens wearers who tried DAILIES TOTAL1® preferred them to their previous lenses.[6]

NEARLY **90%** agreed that DAILIES TOTAL1® contact lenses are so comfortable they sometimes forget they have them on[6]

The first and only lens with Water Gradient Technology



All that touches your eye is a cushion of moisture

OVER **90%** agreed they can comfortably wear DAILIES TOTAL1® contact lenses all day long[6]

A successful practice starts with superior patient outcomes, which is what DAILIES TOTAL1® contact lenses provide for my patients. DAILIES TOTAL1® are the first and only water gradient contact lens on the market today.[1] These high-performance lenses have a unique structure that incorporates different levels of water content from the core to the surface. In a truly remarkable technological development, the water content at the surface of the lens approaches 100%, providing an extraordinary level of comfort from the beginning to the end of the day.[2] The science behind these contact lenses is complex. However, I find that most of my patients today are technologically savvy and eager to learn how DAILIES TOTAL1® provide this level of comfort and to experience the lenses on their eyes.

DAILIES TOTAL1® contact lenses feature water gradient technology to optimize comfort for the full lens-wearing period.[1] The silicone hydrogel core provides high breathability,[3] while the chemistry change from core to surface provides an ultrasoft hydrophilic polymer gel that contains essentially no silicone and mimics the water content of the cornea for superior lubricity.[1,4]

Of course, advanced technology is of little use for patients if it doesn't help them to see, look and feel their best. A patient recently came to my office and told me that his current daily disposable lenses were "fine, no complaints," but when I questioned him a bit more he let me know that his lenses felt dry and uncomfortable by late afternoon. He just assumed that this was a normal part of the lens-wearing experience, looking forward to getting home and taking out his contact lenses! I fit him with a pair of DAILIES TOTAL1® lenses and the effect was, as he put it, "life changing." He was able to keep wearing his lenses late into the evening for dinner and attending his kids' sporting events.

The highest testimonial I can provide for DAILIES TOTAL1® contact lenses is that nearly all of my patients comment on their unique level of comfort, which I describe to them as a "cushion of moisture." Not everyone who tries DAILIES TOTAL1® lenses in our office purchases them, but they leave knowing that we can provide them with the newest technology should they later decide to upgrade to a more advanced vision care option. DAILIES TOTAL1® contact lenses represent Alcon's commitment to innovation and science that produces one-of-a-kind lens technology. These research advances not only improve patients' quality of life and outcomes, but also practice outcomes; a win-win situation for everyone.

Our passion is to help your patients see, look, and feel their best.

SEE LOOK FEEL

References **1.** Thekveli S, Qui Y, Kapoor Y, et al. Structure-property relationship of delefilcon A lenses. *Contact Lens Anterior Eye*. 2012;35(Suppl 1):e14. **2.** Angelini T, Nixon R, Dunn A, et al. Viscoelasticity and mesh-size at the surface of hydrogels characterized with microrheology. *Invest Ophthalmol Vis Sci*. 2013;54: E-Abstract 500. **3.** Pruitt J, Bauman E. The development of DAILIES TOTAL1® water gradient contact lenses. *Contact Lens Spectrum*. June 2013;(Special Edition):1-5. **4.** Alcon data on file, 2011. In vitro measurement of unworn lenses. **5.** Alcon data on file, 2011. **6.** Alcon data on file, 2014.

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OPTOMETRIC SOCIETIES: CATALYSTS FOR CHANGE

Early organizations had to fight in the trenches to pass legislation, battle organized medicine and create a path forward.

BY JANE COLE, CONTRIBUTING EDITOR

"We must all hang together—or assuredly we will hang separately," Ben Franklin said at the signing of the Declaration of Independence. The renegade early optometrists proposing laws and liberties previously unheard of might very well have felt the same way. They knew the work of building a new profession would take collective effort and carry considerable risk, so the impetus to organize was strong.

While today's optometrist looking for like-minded colleagues—be it for solidarity, education or just to shoot the breeze about contact lens sales—has an abundance of options, it wasn't always so easy.

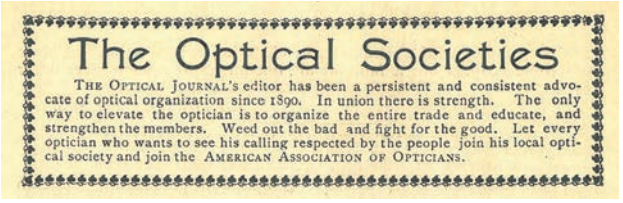
AOA: THE EARLY "REBELS"

Imagine facing jail time for charging a fee for an eye exam. The concern was real for opticians in the late 1800s and early 1900s, as pressure from medicine and an early lack of state laws regulating the rights of opticians left little protection for ODs. This became a rallying cry for a national group that eventually became the American Optometric Association (AOA).

"It is the very conflict with 'organized medicine' that is still an issue today that was the catalyst for the initiation of the AOA," says Kirsten Hebert of the AOA's Archives and Museum of Optometry division. "Arguments over scope of practice and professional jurisdiction, distinction between professionals with ethical codes and codified, regulated licensing from commercial dealers and tradesmen, and the growing science and technology in the fields of optics, medicine and public health gave birth to the discipline and the practice of optometry."

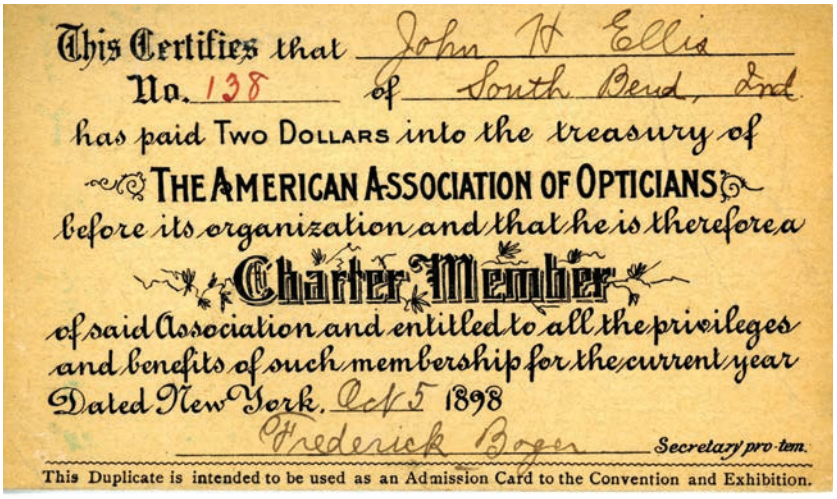
A major tipping point occurred in 1895, when New York optometrist Charles Prentice was threatened with a jail sentence for charging a fee for an eye exam.[1] The charge of "practicing medicine without a license" was one frequently leveled at optometrists in many states at the time, Ms. Hebert said.

One of the early pioneers who helped shape the AOA—along with its first president, Dr. Charles Lembke of New York—was Frederick Boger, the founding editor of *The Optician* and then *The Optical Journal*, both predecessors of *Review of Optometry*. Dr. Prentice, following his near arrest, met with Boger and other key optometric leaders, all of whom recognized the need for legislation to protect optometry and the public.[1] They met in September 1895, a get-together which later led to the formation of the Optical Society of


The Optical Societies

THE OPTICAL JOURNAL's editor has been a persistent and consistent advocate of optical organization since 1890. In union there is strength. The only way to elevate the optician is to organize the entire trade and educate, and strengthen the members. Weed out the bad and fight for the good. Let every optician who wants to see his calling respected by the people join his local optical society and join the AMERICAN ASSOCIATION OF OPTICIANS.

Frederick Boger was a fierce proponent of organizing, and lobbied in the pages of *The Optical Journal* for readers to join the American Association of Opticians.


This Certifies that John H Ellis
No. 138 of South Bend, Ind
has paid Two Dollars into the treasury of
THE AMERICAN ASSOCIATION OF OPTICIANS
before its organization and that he is therefore a
Charter Member
of said Association and entitled to all the privileges and benefits of such membership for the current year
Dated New York. Oct 5 1898
Frederick Boger Secretary pro tem.
This Duplicate is intended to be used as an Admission Card to the Convention and Exhibition.

One of the first signed charter membership forms for the American Association of Opticians, complete with Frederick Boger's signature.

the State of New York, setting the stage for the AOA.[1]

Mr. Boger's rallying cry for an organized group was frequently found on the pages of *The Optical Journal*: "Now for a National Association or an American Association of opticians!" Mr. Boger wrote in the March 1895 edition. "There has been no combined effort thus far to effect such an organization, but we propose now to do whatever we can to bring about such a thing."[2] He then threw down the gauntlet, saying, "an American Association covering the whole country is what is needed, and the men to run it should step forward and organize."[2] Within his editorials, he continued to press the issue, stressing the need for an organization and much face-to-face politicking with prominent opticians.

After the AOA's 1898 founding, Mr. Boger was feeling triumphant. "Naturally," he wrote, "*The Optical Journal* feels an unbounded but a pardonable pride in the achievement of this grand national organization. We have spent nights of thought and days of ceaseless work to bring this thing about."

He later went on to become the first secretary of the AOA, which was initially called the American Association of Opticians, and then renamed the American Optical Association in 1910 before it officially became the AOA in 1919.

Mr. Boger also played a prominent role in the push for a national convention. "The opticians of the United States desire to unite together for the purpose of holding an annual convention to discuss methods and plans for the advancement of the sciences of optics and the exhibition of optical manufacturers," he wrote in *The Optical Journal*.[1]

He continued to push an annual meeting, as he called on the membership to "unite together for the purpose of holding an annual convention to discuss methods and plans for the advancement of the science of optic and the exhibition of optical manufacturers."[3] Boger went so far as to publish applications for charter membership into the AOA in the magazine.[1]

Mr. Boger also had a hand in making exhibit halls a standard, as it was his idea to include exhibits at the fledgling AOA's first meeting, which helped elicit enough interest to attract a good attendance.[1] While the first convention had no educational component, its exhibits included ophthalmometers, which had just come on the market, a collection of eyeglass guards, refractometers, eyeglasses, cameras and opera glasses.[1]

But the early AOA meetings didn't come without challenges, particularly between two opposing member groups: dispensing and refracting opticians. There were "intense feelings of jealousy between the factions and great pains were necessary to keep the meeting harmonious," Mr. Boger reported.[1] This sentiment remained for several years until membership was limited to refracting opticians.[1]

While education is a given at most optometric meetings today, the AOA offered its first educational courses at the 1901 Chicago convention. This included 13 lectures on topics such as "Anatomy and Physiology of the Eye," "The People We Meet in the Refracting Room," "The Eyes of Domestic Animals," "The Use of the Ophthalmometer" and "Optical Advertising."[1]

By 1902, the structure of the AOA began to form, and at the mid-year meeting in Cleveland, a reorganization plan was laid out where a national association would become a federation of affiliated state associations, and a new plan for a House of Delegates selected by state associations was introduced.[1]

During the 1904 meeting, attendees battled over whether to accept the moniker "optometrist." "Can any good come out of constant stirrings up of the sectional feelings between the various classes of opticians?" Mr. Boger wrote in the August 25, 1904 edition of the

magazine. "The action of the Milwaukee Convention, wherein it expressed its approval of the word 'optometrist,' and urged its general use by opticians who refract, will surely be a large factor in the future progress of the Association."[4]

The AOA's first official "congress" was held in 1914 in St. Louis. While the AOA was gaining structure and membership, that meeting had a different set of challenges, mainly the heat. By now renamed *The Optical Journal and Review of Optometry*—or *Optical Journal-Review* for short—the magazine wrote in its pre-convention issues that "rooms with electric fans will be in demand at the hotels" and the Planter's Hotel assured attendees that "each room has circulating ice water as well as a private bath."[4] Temperatures soared to 100 degrees during the congress, and at the annual banquet, men were encouraged to remove their dinner jackets if they were "wearing clean shirts."[5]

The first congress sought to determine how the scope of optometry practice and the qualifications of practitioners should be defined and regulated.[5] With this in mind, the AOA established committees dedicated to setting standards of practice, defining association positions, educating practitioners and the public about the profession, and working to consolidate optometrists under the wing of the association for the purpose of forwarding beneficial legislation.[5]

The scientific section, in particular, performed a critical function.[5] By providing a forum for conducting and disseminating research and building a knowledge base, the section laid the foundation for the development of educational standards and best-practices, clinical guidelines and measures of competency.[5]

Thirty-plus years after the AOA was founded, *The Optical Journal-Review* reported the strides in the national organization, yet hurdles still existed from organized medicine. In the June 30, 1930 issue, the AOA president, George S. Houghton of Boston, wrote in his annual address, "Hardly a day passes that this office is not in receipt of information about our medical friends, or others, that have caused statements to be published which may appear as vitally detrimental to optometry."[6]

Despite the annual meetings, some optometrists still felt more needed to be done to promote education. In an article entitled "A Call to the Colors," published in the Feb. 15, 1934 edition of *The Optical Journal-Review*, Houston optometrist G. Henry Aronsfeld expressed the sheer necessity of annual meetings with a strong focus on research and education to ensure optometry's future. "That our post-graduate work is at the present time in an abominable state of chaos and that this condition is disrupting and disorganizing optometry, must be manifest to all who view the matter from an objective and unbiased standpoint and who look a little deeper than ballyhoo and self-laudation when searching for ultimate results. That these regrettable conditions must remain so indefinitely is unthinkable," Dr. Aronsfeld wrote.[7]

Fast forward to today. The AOA's annual congress, now known as "Optometry's Meeting," has grown to attract thousands of ODs each year for the latest in clinical CE. But undoubtedly, those early pioneers who joined forces to promote and protect the profession set a foundation for what the AOA is today.

Regional CE Meetings Keep it Close to Home

Chances are that no matter where you live in the United States, you're bound to find a regional CE meeting if the national ones have gotten too big and unruly for your taste. Over the last few decades, the growth of annual regional meetings have allowed ODs to earn CE credit in their own time zone—and comfort zone. Just some of the biggest players are the Great Western Council of Optometry, EastWest Eye, the Mountain West Council of Optometry and, of course, the Southeastern Congress of Optometry (SECO), which has national visibility, but retains a distinctly Southern feel.

One of the earliest regional meetings, the Heart of America Contact Lens Society (HOACLS), began in the early 1960s with the goal of providing post-graduate education in the theory and application of contact lenses, says HOACLS president Craig Brawley, OD. The first meeting in 1962 featured 40 original members and three speakers renowned for their contact lens expertise.

By the 1970s, HOACLS was getting recognition as the world's largest meeting devoted to contact lenses, Dr. Brawley adds. In the 1980s, optometry was beginning to expand its scope of practice, and contact lenses became more innovative, he says. As such, HOACLS changed its program by adding primary care education to the meeting.

Today, HOACLS attracts more than 1,200 attendees each year and supports optometry by giving back to the state associations, with $100,000 returned to the five member associations it represents, according to Dr. Brawley. HOACLS also returns funds to any state that has 25 or more doctors attending the meeting and provides scholarships for optometry students.

"The AOA gives members confidence they will have what they need for a thriving, successful future in optometry and the security the profession will be strong," says current AOA president Steven Loomis, OD. "We are a force for public health, the leader for optometry, and a tireless advocate for the profession. We provide clinical tools and continuing education so members can be on the leading edge of patient care. I'm proud to be a part of an organization that has more than 100 years of representing doctors of optometry and am confident that we are poised for another century of being the association for the profession."

AAO: AN EYE ON RESEARCH

In January 1922, nine optometrists and two medical doctors met in St. Louis and began an organization for optometric study in higher branches. In June of that same year, the American Academy of Optometry (AAO) was officially organized with the goal to raise the standards of optometric practice, education and ethics. But in some ways, the AAO had its earliest beginnings in 1898 when the American Association of Opticians was formed.[8] That first national organization brought together members of the profession to improve optometry, and raising educational and scientific standards was also high on the priority list.[8]

The first attempt at creating an Academy was made in 1901 at the AOA meeting in Chicago, when then President A.J. Cross proposed the establishment of an optical college, essentially a "paper college" that would give exams in various subjects. While this didn't gain steam, the AOA created a physiological branch that made up the educational program of the association for the next two decades.

On Nov. 15, 1905, E. LeRoy Ryer, president of the Optical Society of the City of New York, addressed a meeting of the group and proposed the establishment of an American Academy of Optometry with the fundamental idea being certification.[1] Ryer asked if there was an existing organization that "does justice to the superior class of intelligence." He further wonders, "have we any that offers sufficient rewards to warrant men striving to attain membership, have we any that draw a real distinction between the well and poorly educated?"[1] A year later in 1906, AOA President John Ellis addressed the Indiana Optometric Association and strongly favored the formation of the Academy.[1]

The idea of an academy had its share of proponents, but others were strongly against the creation of one, thinking it would be a haven for snobby elitists.

A.J. Stoessel, president of the Wisconsin Association of Optometrists, wrote in *The Optometric Journal*: "I shall give you a few of the many reasons why I do not consider an organization like the proposed American Academy of Optometry advisable. In doing so, I know that an awful fate awaits me, since Mr. LeRoy Ryer, with most magnificent audacity, disposes of any intended criticism of his pet scheme beforehand by classing his critics as 'shallow minds, afraid to be separated from the really deep minds.' Now, is it not fact that men who mistake 'their superficial knowledge for real knowledge' are just the ones that are forever striving to band themselves in select societies and have that holier than

thou feeling that the possession of a membership certification gives them?"[9]

It took nearly two decades more for the AAO to be formed. In the book, *The History of the American Academy of Optometry 1987-2010*, this early group of founders was described as having limited resources, "but their ideals were visionary: they wanted to foster optometric research, education and clinical excellence."[10]

The first annual meeting of the AAO was held in December 1922 with presentation of papers, business sections and election of officers. By December 1929, the membership passed the 100 mark, and attendance at the annual meeting was becoming large enough to attract the attention of scientists as a place to present results of research.[8] In 1930, the first research fellowship was established at Columbia University, and in December 1940, examinations for membership in the academy was given to more than 60 applicants during the annual meeting. This was the first time an achievement test was required and an instruction manual had been prepared for guidance for applications.[8]

In 1947, the American Optometric Foundation (AOF) was created through the vision of William C. Ezell, OD. As the immediate past-president

COPE: A History of Continuity for CE

These days, COPE credit is as essential as the subject matter being taught. COPE-approved CE is necessary for relicensure and has become a standard. But prior to COPE's creation in 1993, individual licensing boards reviewed and approved continuing education courses, which often resulted in a confusing, non-standardized process.

Pre-COPE, each state, regional and national CE provider had to send volumes of information to multiple jurisdictions.[1] This increased costs to CE providers, and optometrists with multiple licenses were often confused as to the specific CE required for license renewal in each jurisdiction.[1] The burden of proof was on the practitioner to contact each regulatory board to determine if a course would be acceptable.[1] "It was an inconsistent, inefficient, and often confusing system," says Jim Campbell, OD, current chair of the COPE Committee.

In June 1991, a senior ASCO executive and member of the Board of Directors of the National Board of Examiners in Optometry (NBEO) addressed the annual House of Delegates of ARBO and challenged the licensing boards to assume a leadership role in improving the current competency standards of practitioners for licensure renewal. To address this challenge, ARBO established the Continuing Competency Assessment Committee (CCAC), comprised of representatives from ARBO, AOA, ASCO and the American Academy of Optometry. This led to the creation of COPE in 1993.[1]

"COPE accreditation standardized the process and reduced the amount of work for licensing boards, CE providers, and optometrists," says Dr. Campbell. "Over time, CE requirements have changed with expanding scope of practice and demands for federal accountability. COPE standards have also evolved, with implementation of the Standards for Commercial support and adoption of accreditation criteria used by other health care professions, to meet the needs of a continuously changing environment."

More than 20 years since its formation, COPE continues to review thousands of courses per year. In 2015, COPE reviewed approximately 4,000 courses.

1. The Council on Optometric Practitioner Education: The Importance of Valid Accreditation of Continuing Education for Maintenance of Licensure and the Public Welfare White Paper. Association of Regulatory Boards of Optometry, COPE. June 18, 2012.

of the AOA, Dr. Ezell along with six other prominent optometrists enlisted the support of the profession to contribute to the creation of "a foundation to uphold, broaden, foster, promote and aid optometric education, the optometric profession and its practitioners."

The idea of a separate program for short clinical courses immediately prior to the annual meeting was approved by the Academy's executive council in 1950, and by the 1955 meeting, postgraduate courses were first presented in Chicago with 41 instructors present.

Today, the AAO achieved its largest attendance in history at the Academy 2015 meeting—7,489 total registrants—an 18% increase over 2014 attendance. This included a record 1,400 student attendees—an increase of 40% over 2014. The surge in student attendees at Academy 2015 New Orleans was not a fluke, as six years earlier, the AAO created a program to help students early in their careers.

SECO: A TRADITION OF CE IN THE SOUTH

The first SECO Congress was held in 1924 in Greenville, SC, where an estimated 100 optometrists attended a meeting and tradeshow. SECO started as a loosely knit organization, with no official ties to organized optometry—it was simply an annual educational meeting.[11]

Optometrists from 13 states and one jurisdiction comprised the original grouping: Alabama, Delaware, the District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Virginia and West Virginia.

While the congress became a staple for ODs through the years, as scope of practice laws began to change in the 1970s, SECO's courses expanded to provide professional development in the new arena of diagnostic pharmaceuticals. The profession's strategy of "educate, then legislate" created a need to prepare practitioners for a whole new level of patient care and SECO stepped in to provide this.[11]

Frederick Boger, far left, gathers with other AOA members at an early meeting.

Today's annual congress held in Atlanta is a mainstay of the large optometric meetings and generally features more than 400 courses and 170 CE credit hours.

FROM OPTIFAIR TO EXPO

Optometry conferences traditionally focused on education and politics, with exhibits being a part of the event but not central to it. That changed in 1978 when Irving Bennett, OD, launched the OptiFair, a meeting that gave products due prominence along with education. In 1986, OptiFair morphed into Vision Expo. The year prior, leaders from the Vision Council & Reed Exhibitions (formerly Vision Industry Council of America and Cahners Exposition Group, respectively) signed an agreement to jointly acquire the OptiFair trade show. In 1988, Vision Expo expanded by acquiring the Better Vision Institute to encourage more frequent eye exams.

Now celebrating its 30th anniversary with two annual meetings, Vision Expo East in New York City and Vision Expo West in Las Vegas, Vision Expo has expanded in recent years from being a frame show to a heavy hitter in the clinical CE arena.

In an effort to provide more relevant clinical content

OptiFair: The First US Optometric Trade Show

By Irving Bennett, OD

Probably the most important day of my non-practice business life happened in the spring of 1977 when Advisory Enterprises, the publishing firm I headed, held a gathering of optical/ophthalmic leaders. More than 100 manufacturers and distributors gathered at New York City's prestigious Plaza Hotel. The speaker was a statistician from Washington, DC who had just published detailed data on the optometric profession and the optical industry. The report stated that the optical part of the industry generated about $6 billion dollars in sales and that it had to do things differently to stimulate growth.

My lack of due diligence on hiring a speaker, sight unseen, was soon evident. He had the data all right, but his presentation was dry and boring—very boring.

As master of ceremonies, I knew I had to do something. When the speaker paused to make a point about 40 minutes in, I stood up and said, "Thank you so very much for that inspiring speech." And I started to applaud. The audience, though surprised, followed suit. "You have heard the data and our need to do something to stimulate more eye examinations and more eyewear sales," I said, adding "why not a show in Madison Square Garden for optometrists, ophthalmologists, opticians and for you to display your products?"

The applause was spontaneous and enthusiastic. That was the day OptiFair was born.

The first OptiFair, held on March 3, 1978, was a booming success. We had promised exhibitors we would attract more than 5,000 professionals to the show—not counting anyone not involved in the professions. No optometric convention before had ever approached 5,000 attendees. We had 6,511. In the words of one exhibitor, and echoed by many, the atmosphere was "electric."

We had 30 OptiFairs in all and our attendance numbers in New York topped 10,000 at our last OptiFair.

But the principals at Advisory had accomplished what they set out to do, and it was time to sit back and smell the roses. We sold our publishing/meeting company in 1987. It was a great run.

OptiFair changed how meetings were conducted for optometrists and opticians. Ophthalmic meetings usually had only two or three, maybe four, lecturers with good reputations. OptiFairs used at least 50 lecturers per show, giving many aspiring speakers a chance before a national audience. We "discovered" many gems, and many OptiFair alumni are still on the lecture circuit. We provided free registration, making it easy for "non-members" to visit the exhibits. We gave every registrant a white badge, not segregating professionals with different colored badges. We were one big community, not several smaller ones.

We gave ophthalmic techs the opportunity to have a meeting with a selection of courses to help them do their jobs better. OptiFair was one of only a few opportunities for ancillary personnel in professional offices to get thorough education. We incorporated workshops as educational vehicles. We encouraged exhibitors to provide special no-charge "Exhibitor Seminars," and we suggested larger exhibitors provide out-of-the hotel events, such as an evening at the Radio City Musical Hall or a cruise in New York Harbor to maximize their contact with customers.

and educational opportunities for the entire office, Vision Expo added veteran optometrist Kirk Smick, OD, to join its conference advisory board in 2007, a Vision Expo spokeswoman said. Today, VEW recruits new members to the advisory board who specialize in key educational areas of the profession, she added.

Total attendees each year average roughly 30,000. Each meeting also includes some 320+ hours of education, according to Vision Expo.

Today, optometrists have assured their standing as vital contributors to the American health care system and have more CE meetings to choose from than ever before, thanks to those early pioneers who paved the way for the evolution of the profession. Bifocal inventor Ben Franklin would be proud! ■

1. Gregg JR. American Optometric Association, A History. American Optometric Association. 1972:3,7-10,20.
2. Optical Journal. March 15, 1895:13.
3. Optical Journal and Review of Optometry. May 15, 1947:52.
4. Optical Journal. August 25, 1904;14:525.
5. www.aoa.org/about-the-aoa/archives-and-museum/exhibits/the-congress-of-1914?sso=y.
6. Optical Journal. June 30, 1930:24.
7. Aronsfeld GH. A Call to the Colors. The Optical Journal-Review. Feb. 15, 1934:20-21.
8. Gregg JR. History of the American Academy of Optometry 1922-1986. American Academy of Optometry. 1987-2010:3,5,7.
9. Stoessel SJ. Against the Optometrical Academy. Opt J. March 1, 1906;17(10):401.
10. Newcomb RD, Eger M. History of the American Academy of Optometry 1987-2010. 15.
11. www.secointernational.com/about-us/history.html.

A FIGHT FOR THE RIGHT TO LEARN

Nothing has come easily for the profession of optometry, and education is no different. But it's come a long way from the days of apprenticeship.

BY ADRIENNE TARON, ASSOCIATE EDITOR

As with any profession, education has been instrumental in laying the groundwork for the evolution of optometry—but not without controversy. When optometry first emerged as a distinct profession in the 1890s, education was primarily through apprenticeship or privately owned schools—all without much, if any, regulation.[1] Schools provided informal education, often in the form of short, two-week courses or correspondence courses.[1] It didn't take long for the early founders of the profession to realize that wasn't going to cut it, and within two decades, many of these private schools served as foundations for what became more formalized institutions.[2] The journey from those two-week courses in the early 1900s to the six-year experience of today is riddled with controversy, hard work and professional triumph.

WHERE IT ALL BEGAN

As the profession itself developed from one of jewelers and spectacle salesmen to refractionists and finally primary care providers, so too did the ivory towers grow to meet the needs of the profession and the public.[3]

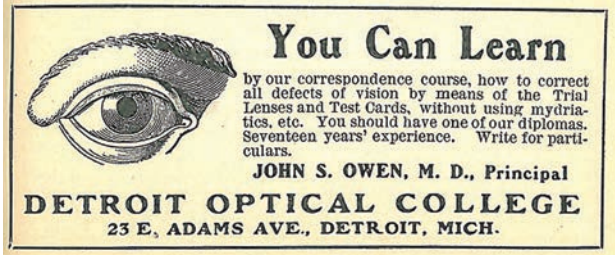
The first pair of spectacles came to our shores in 1620, and over the next 250 years, optometry blossomed from an optical business into an invaluable health care profession.[4] As the profession shifted to encompass more than spectacle dispensing, the need arose for more formalized education. The private schools of the late nineteenth century gave way to a more standardized curriculum as Columbia University's School of Optometry, founded in 1910, became the first university-based school of optometry in the United States.[1]

By 1928, the New York Commissioner of Education saw the benefit of Columbia's program and passed a bill allowing only graduates of a university-affiliated school of optometry to qualify for the state board exam. This signaled the end of the apprenticeship system of licensure and initiated a new era in optometric education.[5]

Optometric education began to boom, and several schools opened over the following decade, with the first public college of optometry, Ohio State University (OSU), being founded in 1914.[1] Battles then ensued regarding the nature of the field's growth and its correspondence to educational institutions.

EDUCATION REGULATION

The Optical Journal and Review of Optometry chronicled the back-and-forth arguments regarding the direction optometric education should take. A 1934 retrospect by Dr. Thomas McBurnie sums up the confusion and dissonance apparent within the field: "for many years the question of optometric education has been discussed in its many phases by many of our optometric



The humble origins of optometric education.

leaders with many varying viewpoints."[6] The biggest fight was how to gear education toward the professional advancement of the field, not simply the commercialization of the practice. Since its founding in 1898, the American Optometric Association (AOA) had as its mission to increase the professionalization and move away from the commercialization of optometry.

In his 1934 article, Dr. McBurnie supports the need within the AOA for a committee whose sole objective would be to take stock of these educational questions and "bring forth a definite program of education which would continue through the years and should not be hampered by the ever-changing administration of the AOA official body."[6] His call for a special committee gave rise to the Council on Optometric Education (COE) in 1925, which was comprised of volunteers tasked with accrediting optometric educational institutions. The COE was established in 1934 as the accrediting agency for OD education, with Dr. Charles Sheard at the helm. Later changing its name in 2001 to the Accreditation Council on Optometric Education (ACOE), this body is still in charge of accrediting optometric educational institutions.[5]

Recently, ASCO's Committee on Attributes researched and developed competency statements regarding knowledge, skills and professionalism in 2000, and released a revision in 2011. The extensive list of attributes makes clear the expansion and development that has occurred over the last 125+ years with respect to optometrist's demand, competency and capability.[8,9] The foundations of today's education took shape between 1935 and 1955, when a formal curriculum was developed—a six-year track comprising two years of liberal arts and four of specialized professional education.[10]

The next decade saw a boom in optometric education as evinced by OSU's offering of a PhD degree in physiological optics under the direction of Dr. Glenn A. Fry.[3]

THE PROS AND CONS OF EXPANSION

This expansion was met with excitement and reticence, as exhibited in a 1938 article in *The Optical Journal and Review of Optometry* that addressed the rapid progress of optometric education while cautioning for quality over quantity—stressing the importance of a more stringent rating system to provide "optometry with an academic place equal to other professions."[7] The tone of the discussion in the late 1930s is tellingly defensive, with one contributor arguing that, "we should not give up optometry to any other group or profession […] anyone desiring to practice optometry should qualify by taking the prescribed training and the state board examination for licensure."[7]

Photo: Pennsylvania College of Optometry

A student clinic at PCO in the 1940s.

An August 1937 article in *Reader's Digest* lambasted the profession for its academic institutions and the state of its educational standards. The writer addresses the high number of optometrists he deems to have come from "inferior" or "extinct" institutions. "Higher requirements under state optometry laws […] reduced the number of recognized schools to eight," he writes—further suggesting that, "on the face of the figures, the graduates of the better schools must be in the minority."[10] (*see,* "A Black Eye for Optometry," *p. 98*).

"In 1925, there were about 25 optometry schools, but efforts launched in the early 1920s to establish standards in optometric education decreased the number of schools to nine by 1927," says David A. Goss, OD, PhD. "A leader in that standardization effort was an optometrist named Frederic Woll (1874-1955), who drew up syllabi of what should be covered in optometric curricula and visited schools in order to rate them."

By 1941, Dr. Woll's determination, and that of other eager practitioners, led to a new hurdle within the profession. "The eagerness to raise optometric educational standards has contributed to the problem of student supply," *The Optical Journal and Review of Optometry*'s editor, Maurice E. Cox, wrote the same year.[11]

"The numbers of students in optometry schools dropped considerably during World War II, but there was a great influx of students after the war as veterans returned and attended school on the G.I. Bill," Dr. Goss says. "The number of optometry school graduates swelled from a low of 157 in 1945 to 1,934 in 1949." Edmund Richardson, president of the AOA, wrote in *The Optical Journal and Review of Optometry* in 1946 about his concern over the very large classes in school at that time."[12]

From Projectors to PowerPoint

I love to reminisce to my students, "When I was your age we learned optometry by candlelight, reading cuneiform tablets in cold, dank rooms with no heat—and we had to walk uphill both ways with no shoes!"

When I began teaching, most instructors used either the blackboard—with or without multi-colored chalk—or a projector with static-electricity-prone transparencies and a felt-tip marker. The advent of the computer allowed the ordinary professor to make real, professional academic slides, but when computers first came around, we all had to share. Getting your institution's audio-visual specialist to help produce professional quality slides took great planning, money and a large buffer for turnaround.

Clinical photos were taken with an anterior segment camera or fundus camera; sometimes it took weeks for the roll to be used up and developed. There was no checking to see if you got the shot. In fact, if someone lost the film, the developer made a mistake, the shot was out of focus or the patient blinked, ya got *nuthin'*!

Once you had your slides, you had to store them in a plastic leaf and load them into a carousel just before the presentation or keep them permanently loaded in a dedicated carousel. Each method had advantages and disadvantages. Sleeves were cheap, and "sleevers" could travel light and reuse slides for different presentations. However, sleevers would often load in haste and put slides in upside-down or backwards. Slides could get lost or misfiled. "Carousellers" did not have those issues; they would load the carousel, double check it, label it and seal it forever. Very expensive. (I was a carouseller; I have no less than 20 of them gathering dust). What a nightmare for travel. And unless you had duplicates, once a slide was used it was out of the rotation.

Research was no picnic either. There was no Internet; there were only scores of textbooks, bound journals and the card catalog. You could not do this from home, a coffee shop or anywhere else for that matter. It had to be done in your library. You had open books everywhere. The tables were 64 square feet and when you needed a reference you had to run around the table to find it. If you didn't finish, it could take an hour to put everything away and an hour the next day to set it up again.

Getting work published was also an exercise of will. There was no email. Each paper, complete with photos, diagrams and captions, had to be typed, double-spaced and copied in triplicate. They were mailed to the editor-in-chief (EIC), who distributed them to the referees. They wrote all over the copy and returned it to the EIC, who sent it back with a letter announcing the verdict: accepted or rejected. If you got accepted, corrections had to be made. Cut and paste was exactly that—you typed the corrections on a typewriter and then *literally cut and pasted* the changes into place. References were a nightmare.

The Internet, laptops and digital cameras have made all of this obsolete. Now, you can make and edit slides on the spot; you can see each photo we shoot and can transfer them directly to the computer or printer. Research is accomplished using search engines with key terms and filters that narrow the field and find data quickly. Now there's email for everything ... easy peazy.

I could go on about "the good ol' days," but space is limited. Anyway, if you are an old-timer like me, take some time to reminisce. If you're a recent graduate, some day you'll tell a similar story and claim the snow was colder and deeper.

—Andrew S. Gurwood, OD
Pennsylvania College of Optometry

The need for further exposure and new marketing techniques to promote growth in the field was not lost on the AOA, and public relations focused on an "enlarged opportunity for self-projection."[13] Of course, filling seats in the classroom had to coincide with an ever-improving curriculum.

Cox cited the AOA's having consistently stressed the significance of the availability of optometric educational facilities and notes the steps optometry schools and colleges had taken to form an organization of their own to provide for regular inspection of the curriculum and institutions.[13] The struggle between promoting the field and ensuring quality standards continued for decades.

CONCERNS COME FULL CIRCLE

Today's suspicions about a glut of grads is nothing new. "From 1956 to 1965, the numbers of optometry school graduates were less than 400 each year," Dr. Goss says. "By the late 1960s, some were suggesting that a perceived need for more optometrists should be met by a doubling of the number of schools from the 10 in the mid 1960s. In 1965, there were 377 graduates from 10 schools, which can be compared to [the] 1,404 graduates [from] 21 schools in 2012." This growth in optometry—waxing and waning over the last century—has historically been met with varying approval.

In 1937, Mr. Cox argues that, "while on the one hand optometry is greatly undermanned, on the other the pro-

The Story of Columbia University

Because New York was the first to attempt to pass an optometry licensure law, it's no surprise that it also became home to the first optometry school affiliated with a university.[1] New York successfully passed an optometry law in 1908, and Columbia University School of Optometry began just two years later in 1910.[2] Charles Prentice himself formulated the course, which included general physics, anatomy and physiology of the eye, theoretic optometry, pathologic conditions of the eye and practical optometry, to name a few.[2,3] Another founding father, Andrew Cross, became the school's first active director.[3]

The program only had to enroll 12 students, but the first class was already robust at 21.[2] It was an immediate success, and the inaugural class submitted a letter of thanks to *The Optical Journal and Review of Optometry* in December to "extend their thanks and grateful appreciation for the invaluable services [the school has] rendered in behalf of the profession."[2]

The Optical Journal-Review also published an editorial in 1910, stating "Now that Columbia University is to give a course in optometry, optometrists of those States which are not near to the site of this institution are discussing the need of getting the universities of their localities to put in a similar course."[2] Such immediate notoriety illustrates its pivotal role in the history of the profession.

Although those seeking an optometric education held the school in high esteem, continual pressure from ophthalmology eventually led to the school's closure in 1954. The alumni organized an immediate protest, claiming the university "failed the people of the state of New York by cutting off the source from which stemmed some great contributions to the science of vision."[4]

Later that year, in an attempt to fill the educational void in New York, a small group of optometrists founded the Optometric Center of New York (OCNY), a nonprofit health and education resource.[5] It took more than a decade of lobbying before the New York State Legislature voted to establish a new college of optometry. The State University of New York (SUNY) College of Optometry enrolled its first class in September 1971, and has been a powerhouse of education ever since.

1. Goss DA. Landmarks in the History of Optometry. Hindsight: Journal of Optometry History. 2007;38(2):47-52.
2. Goss DA. One Hundred Years Ago: Start of the Optometry School at Columbia University. Hindsight: Journal of Optometry History. 2010 Oct;41(4).
3.Cox ME. Optometry, the Profession: Its Antecedents, Birth, and Development. Chilton Co., 1947.
4. Optometry Alumni Organize to Protest School's Closing. The Columbia Daily Spectator. 1954 Sept;99(2).
5. History and Mission. State University of New York College of Optometry. www.sunyopt.edu/about/history-and-mission.

fession appears to have an overstock of the wrong kind of material. Specifically, [that] too many of those coming into optometry do not have the proper professional concept."[14] This argument could easily be transposed to contemporary concerns within the field. Today, with 25 optometry schools to choose from, many dredge up the age-old argument about quality over quantity. The debate over the 2016 opening of University of Pikeville-Kentucky College of Optometry, for example, is eerily similar to concerns voiced over the last 125 years.

"Acceptance rates for medicine and other health care professions are around 40%, and at the moment, optometry has an acceptance rate of 70%," Dominick Maino, OD, MEd, a professor at Illinois College of Optometry, says in a recent *Review of Optometry* news article. "Although this has not appeared to affect the quality of our entering classes, at some point I would suspect that quality will suffer."[15]

KYCO capitalizes on its geographic location with aims to meet a public health need in an underserved area; yet, several ODs expressed disapproval about opening a new optometry college and trying to fill classes with qualified students and overcrowding in the field—the same story from 1937 come back to life.

Growth, however, continues despite the reoccurring arguments regarding the oft-perceived fraught future of the profession. Optometry's educational history may continue to repeat itself as each new school opens its doors, sparking the new-old debate where the heart of the future exposes its age-old roots. But the undeniable progress leaves optometry solidly recognized as an integral sect of the medical field. ■

1. Goss DA. Landmarks in the history of optometry. Hindsight: Journal of Optometry History. 2007;38(2):47-52.
2. Book on the history of the Illinois College of Optometry. Hindsight: Newsletter of the Optometric Historical Society. 1998;29(4).
3. Shaver DV. Opticianry, optometry, and ophthalmology: an overview. Medical Care. 1974;12(9):754-65.
4. Register SJ. A backward glance on optometric educational Institutional profile of schools and colleges of optometry. Optometric Education. 2011;36(2):76-81.
5. AOA website. AOA historical timeline. http://fs.aoa.org/optometry-archives/optometry-timeline.html. Accessed April 1, 2016.
6. McBurnie T. The AOA year in retrospect. The optical journal and review of optometry. The Optical Journal and Review of Optometry. 1934 July:22-5.
7. Folsom LP. Our educational problems. The Optical Journal and Review of Optometry. 1938 July:14-5.
8. Optometric education. Attributes of students graduating from schools and colleges of optometry: An Association of Schools and Colleges report. 2000;26(1):15-19.
9. Attributes of Students Graduating from Schools and Colleges of Optometry: A 2011 Report from the Association of Schools and Colleges of Optometry. 2011.
10. Riis RW. Optometry on trial. Reader's Digest. Aug 1937;31(184):77-85.
11.Cox ME. Sustaining and projecting optometry. The optical journal and review of optometry. 1941;78(14):34-7.
12. Richardson E. The optical journal and review of optometry. 1946;83(22):46-51.
13. Hirsch MJ, Wick R. The optometric profession. New York: Chilton Book Company, 1968.
14. Cox ME. A little more selectivity. The optical journal and review of optometry. Sept 1937:20-1.
15. Hepp R. New OD school debut sparks debate. Review of Optometry. 2016;153(1):6.

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[1] J.M. Nolan et. al., Exp. Eye Res., 2012; 101:9-15

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DAYS OF DIVERSITY

Wartime needs, demographic shifts and the elevation of women in society remade the identity of the profession.

BY ALIZA BECKER, SENIOR ASSOCIATE EDITOR

If you were to ask the attendees of the 1901 AAO meeting—the very serious, mustachioed gentlemen shown below in *Figure 1*—or any of the clean-shaven-but-still-heavily-male group displayed in *Figure 2a* who they believed their successors might be, it's likely that they would not have been able to picture the diverse and all-inclusive group of 2016 college graduates in *Figure 2b*. Overall, today's optometrists are a far cry from the founding members of the profession, both demographically and in mindset.

Initially run as an apprenticeship in which candidates were selected mostly on the basis of familial connections, optometry's earliest practitioners at the turn of the 20th century were predominantly sons from upper class families who could afford the fees associated with private colleges and tutors.

Beginning around this time, however, the country as a whole was entering a dramatic shift in demographic makeup, with immigration into the United States exploding in conjunction with world events. More significantly, women's rights and desires were also evolving with changes in the nation's legislature and culture.

By 1939, female optometrists in attendance at that year's convention of the American Optometric Association in Los Angeles were discussing the feasibility and desirability of forming an optometric women's society along the lines of similar organizations among the women physicians and osteopaths. At the time, only 35% of the total number of registered optometrists belonged to the AOA, with only 3.6% of the number of registrants being women (out of 631 members total).

"Although optometry as a vocation holds many attractions for women, the statistics clearly indicate that the number of women entering the profession has been woefully small," Arene Wray, OD, wrote in September 1956.[1] Dr. Wray had been chronicling the progression of women—or lack thereof—for *Review of Optometry* since at least 1940. That year, "the classified directory of the City of Los Angeles listed twenty-two women optometrists," she wrote. "This figure dropped to 19 in 1950, and in 1955 the number dropped again to 10, which is less than 3% of the total number of optometrists in Los Angeles."[2] This number jumped to 6.2% in 1950 but then dipped down to 4% in 1954, the author added.

Fig. 1. The attendees of the 1901 American Association of Opticians meeting.

Minorities too, also, may have had difficulties entering the profession due to the presence of Jim Crow and Chinese American exclusionary laws.

STEPPING FORWARD

So how, then, did we reach the level of diversity we experience in the profession today? The answer is a combination of outside legal, economic and population demands as well as the growing space within the profession itself for new individuals to join. "In 1920 there were in the United States, 17,294 practicing optometrists for a population of 105,710,620. The population had grown to 122,775,046 by 1930 and the number of practicing optometrists had increased to 17,765, yet on a comparative basis this represented an actual loss of 13% in the 10-year period," commented a *Review of Optometry* article in 1942.[3]

A separate article in December 1942 noted the shortage of "medical men for both civilian and war purposes," suggesting the place to look for the necessary students to fill the vacuum was among "young women looking for a career; young men in high schools who have some minor physical defect that will keep them out of strenuous occupations, and older men who have found themselves misfits in the profession they first chose."[4] Medical school dropouts might also make good optometrists as well, one indelicate writer suggested: "there is one source that has always been overlooked by us, but not by osteopathy. All medical schools allow about twice the enrollment in the freshman year that they graduate in the senior year," the author of the article noted.[4]

The University of California Berkeley Optometry Archives

The University of California Berkeley Optometry Archives

Fig. 2. (a) On top, alumni from the University of California Berkeley School of Optometry sit in the school's library in 1931. (b) On bottom, the UC Berkeley class of 2016 stands proud on graduation day.

General opinion may also have helped to sway the profession's acceptance of female members. "Optometry offers an excellent profession for women with scientific, biological interests who possess the required intellectual endowment, and it holds forth reasonable expectation for an interesting successful vocation," commented Dr. Wray in a January 1951 article.[5] Furthermore, "optometry calls for painstaking detailed work for which women are temperamentally well-suited. Children are less fearful of women doctors than they are of men. Moreover, women optometrists are extremely enthusiastic about their work and convey this feeling to their patients," she added in 1956.[1]

Perceptions such as these demonstrated the changing attitudes towards the inclusion of women in the profession, concluding that "we shall have to look to the young women in high schools and colleges to help maintain the supply of optometrists necessary to take care of an increasing population, both of school children and of older people, and to fill the vacancies in our ranks caused by retirement and death."[1]

GLOBAL IMPACT

Once secluded to Europe, optometry is now recognized around the world as a formal profession, bringing new individuals into the fold. Over 90 countries now report the existence of some form of the job, with varying requirements for recognition.[15] Australia, for example, offers five recognized course tracks in optometry at varying universities. France, however, does not have any regulatory framework in place for the profession, with interested parties simply required to complete an apprenticeship at an ophthalmologist's private office.[16] Additionally, other countries limit the scope of practice to simply refraction or other services, while some prohibit optometrists from examining patients under or over a certain age.[17] In still other parts of the world, eye care is simply provided by foreign optometrists who are temporarily in residence, suggesting the need for more licensed individuals may still be there.[18]

CUTTING TIES

In addition to diversifying its ranks, the profession also faced—albeit much earlier—the problem of distinguishing itself from now-opticians and also authenticating itself in the eyes of the government.

"Any MD can set himself up as an 'oculist'; and because so many incompetents did just that, the Guild of Prescription Opticians of America invented the 'eye physician' title to designate men considered deserving of its goodwill and sponsorship," Herbert S. Marshutz wrote in the 1943 issue of *The Optical Journal and Review of Optometry*. "The point we are endeavoring to make is simply this: that any graduate and licensee in optometry can and does (with minor exception) call himself 'optometrist.' But unlike the eye physician, a majority of the registered optometrists of the United States do not affiliate with organized optometry, are not members of the official organization and do not enjoy the inspiration of its ideals and ethics. As merchandisers of spectacleware, calling attention to their establishments through undignified, unethical advertising of one type or another—and all too much of it smelling of quackery with bait-alluring copy—it is this majority that America knows as optometrists."[9]

The problem of legitimacy continued long into the years of the profession, with comments like "his only objective was to make as much money as possible, as quickly as possible" and "no training in optics or eye care" characterizing some of the more concerning representations of the profession. "We in the service of our country are taking a beating that we aren't going to forget," Cpl. G. L. Lang wrote in an open letter in 1944 to the unethical members of the optometric profession.[10] A separate piece in 1941 noted "there were, unfortunately, too many optometrists who were unable to distinguish between truth and sophistry, between sincerity and deception and between education and camouflage."[12]

Furthermore, the separation from ophthalmology was also an issue. "British optometrists were certainly used during the war, but generally as assistants to ophthalmologists rather than in their own right. But we did get other recognition; I was asked to take charge of a newly created eye clinic in a huge ammunition factory (34,000 workers) during the early months of the war. I built up a team of optometrists and we ran a daily attendance at this clinic, which was part of the medical setup," wrote optometrist Frank Dickinson from England in the January 1973 issue of the Optometric Historical Society's newsletter, while another account, in June 1942 *Review of Optometry*, noted that "the first matter to come up [at the AOA meeting] was the attempt then being made by New York optometrists to have the State Workmen's Compensation Act amended to give them a measure of recognition. The ophthalmologists were displeased because they felt the wording of the bill appeared to give optometrists a right to 'treat' eye injuries."[13,14]

DISTINGUISHED SERVICE

The war effort shifted the demographic and workforce patterns as well, creating new opportunities for both male and female optometrists. As male ODs were drafted or enlisted, more women entered the field, paralleling the experience of other professions. "A very respectable amount of research was done on accommodation and convergence in the American Expeditionary Force laboratories at Mineola, Long Island, New York, during and following World War I," wrote HW Hoffsteader, editor of the Optometric Historical Society newsletter, in October 1971. "Someone, somewhere a few years ago told me that there was an optometrist or two or three on the research staff."[6]

Government organizations also began to ask optometrists to provide refraction services and assist with surgical procedures, which may have drawn many practitioners away from their initial plans to open a private practice. One of the first optometrists in the US Army in World War II wrote, "during the absence of our commissioned eye physician, which lasted almost three weeks, I carried on the work of the department, diagnosing and treating eye diseases and performing minor surgical operations. Even though my training as an optometrist did not qualify me for the practice of medicine, nevertheless, the results were entirely satisfactory and I was generously complimented for the services rendered."[7]

The role of ODs in the armed forces weighed heavily by both the government and those involved. "On the one hand, we have optometrists serving in their professional capacity in the Navy and with commissioned rank; on the other hand, there are optometrists serving equally well as refractionists in the Army but with non-commissioned rating the best they can get and that only in some instances. On the one hand, we find high medical officers who are not entitled to commissions; on the other hand, we know that many ophthalmologists are far from attaching such secondary importance to refraction, some even holding it to be part of medical practice," wrote Maurice E. Cox in the 1942 issue of T*he Optical Journal and Review of Optometry*.[8]

The Veteran's Administration hospital system began hiring optometrists to serve on staff in 1940, later formally approving and funding the country's first program to train optometry students in 1972. As patient demand for services also continued to increase, the concept of private practice gained

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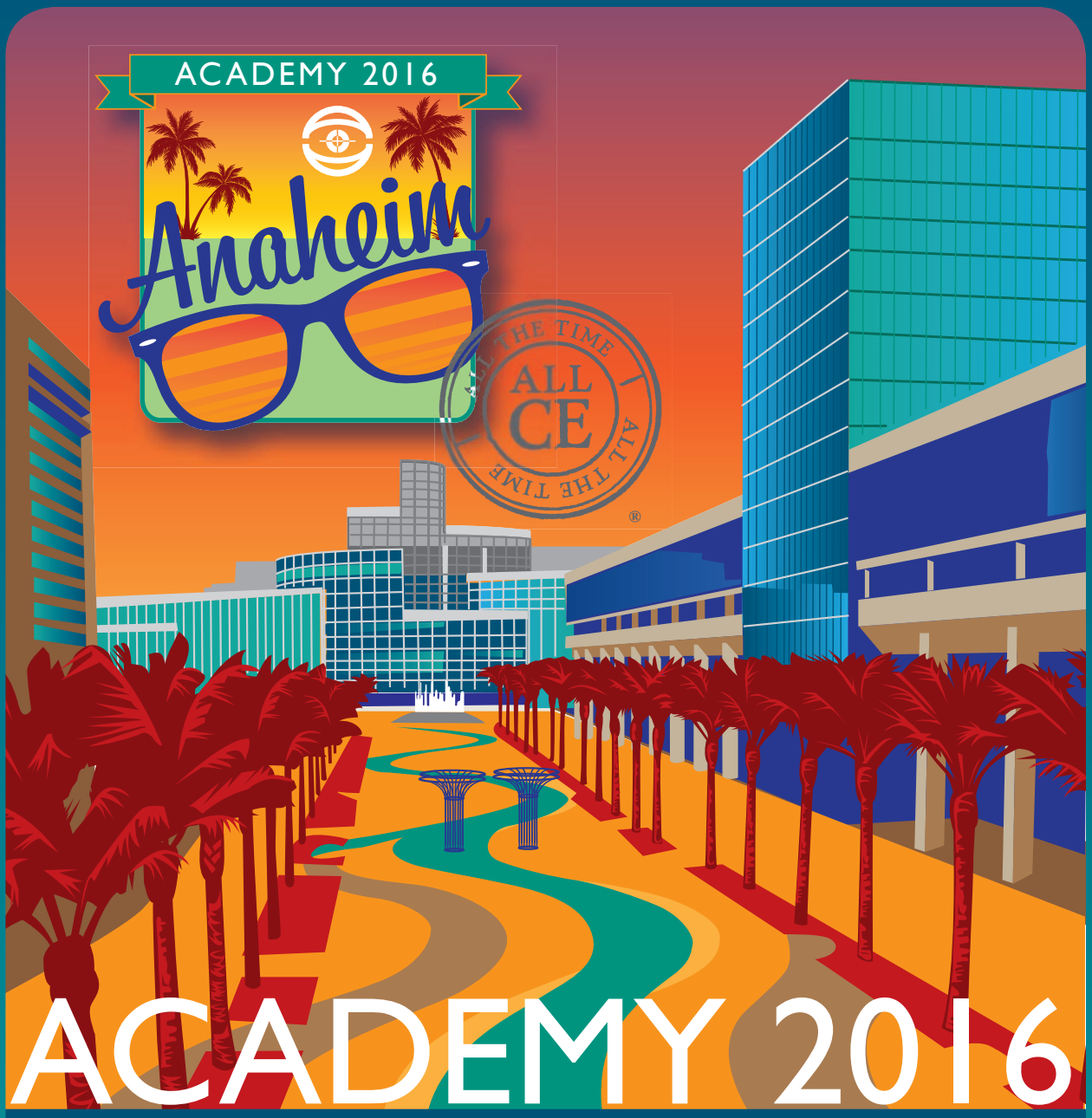

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traction, with more and more optometrists moving to open their own businesses independent of one another.

Today, according to a summary put together by the American Optometric Association in 2011, there actually appears to be an adequate supply of optometrists, with the estimated amount of practitioners recorded at 39,580 individuals at the time of the study: 60% of males with a mean age of 51, and 40% of females with a mean age of 40. This number is expected to remain adequate to meet the projected demand through 2025 as young women continue to enter the workforce from optometry school. An eye must be kept, however, on the proposed growth and aging of the US population, increase in prevalence of diabetes among patients, and expected expansions in US healthcare coverage and scope of federal law.

Once excluded from the ranks of optometry, women now comprise the majority of new grads and over half of all current practitioners. Recognizing the changing composition of the optometric audience, the publication *Women in Optometry* was launched in 2006 to celebrate the achievements of female optometrists and to assist with networking opportunities. The election of Andrea P. Thau, OD, the American Academy of Optometry's 95th—and only second female—president was highlighted in the June 2016 issue. ■

1. Wray AT. Women in Optometry. Optical Journal-Review. 1956 Sept;45-46.
2. Wray AT. About the Women in Optometry. Optical Journal-Review. 1940 May;21-22.
3. Cox ME. The immediate problem. Optical Journal-Review. 1942 Nov:36.
4. Rogers JD. More Manpower for Optometry. Optical Journal-Review. 1942:32.
5. Wray AT. Optometry's Attractions for Women. Optical Journal-Review.1951:90-94.
6. Hofstetter HW. Newsletter of the Optometric Historical Society. 1971 Oct;2(4).
7. Hofstetter HW. Corporal Engelmann, OD. Newsletter of the Optometric Historical Society. 1973 Jan;4(1):13-14.
8. Cox ME. Expert service, poor recognition. The Optical Journal-Review. 1942 Oct;79(19):28.
9. Marshutz HS. Thoughts on optometry—today and tomorrow. Optical Journal-Review. 1943 Mar:20.
10. X. I was a Chain Store Doctor. Rev Optom. 1987 Feb:124(2):43-44.
11. Lang GL. An open letter to the unethical. Optical Journal-Review. 1944 Nov;26.
12. Aronsfeld GH. Optometry's Past and Present; A Program for Its Future. Optical Journal-Review. 1941 Feb:20-44.
13. Hofstetter HW. British optometrists in WW II. Newsletter of the Optometric Historical Society. 1973 Jan;4(1):14.
14. Cox ME. Interprofessional Developments. The Optical Journal and Rev Optom. 1942 Jun;79(11):20-21.
15. World Council of Optometry. Who We Are. Available at: www.worldoptometry.org/en/about-wco/. Accessed June 8, 2016.
16. EurActiv.com. French move to create new eye professionals. Available at: http://www.euractiv.com/section/health-consumers/news/french-move-to-create-new-eye-professionals/. Accessed June 8, 2016.
17. Padilla MA and Stefano AFD. A Snapshot of Optometry Around the World. Available at: https://www.reviewofoptometry.com/article/a-snapshot-of-optometry-around-the-world. Accessed June 8, 2016.
18. Fleming L. Practicing in South Africa. Rev Optom. 1987 Mar;124(3):52-56.

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A BLACK EYE FOR OPTOMETRY

In 1937, *Reader's Digest* took a swing at the young profession in a scathing investigative report, but optometry came back fighting.

BY JANE COLE, CONTRIBUTING EDITOR

When you think of *Reader's Digest*, a feel-good publication your grandmother reads might come to mind. But in its early days, this American legacy had a more hard-nosed edge. In 1937, optometry was in its crosshairs.

In August of that year, *Reader's Digest* published an investigative report, "Optometry on Trial," that purportedly "revealed grave abuses in the field."[1] The firestorm of responses it elicited amongst the optometry profession and the medical community played out in the pages of both that magazine and this one, then known as *The Optical Journal and Review of Optometry* (*Optical Journal-Review* or *OJRO* for short).

The two-part *Reader's Digest* series was written as a nationwide, behind-the-scenes investigative report. Over a 10-month period, six individuals went "undercover" to optometric practices across the United States, and their experiences were recorded. The results? After visiting numerous offices, each of these undercover patients essentially received a different diagnosis from each practitioner. Worse, the patients would then be charged for a new set of glasses, since they were told the prescription sold to them by the previous optometrist was incorrect.

The tone of the first article implied that optometrists were unskilled hucksters, trying to make a buck from unwitting patients. In other words, optometrists were untrained at best and unscrupulous at worst, selling their patients glasses whether they needed them or not.

The first article in the series, published in August 1937, shared this grim assessment: "There are many conscientious and skilled optometrists; men who will frankly admit their limitations when they see that the eye conditions of their visitors are behind their abilities and training," the author of the series, Roger William Riis, wrote. "But there are many optometrists—far too many—who blithely undertake problems beyond their training. To consult one of these, when you have serious eye trouble, may be worse than useless."[1]

One of the patients, a 13-year-old girl, visited optometrists at practices from Boston to the Rockies, and at each location she was given a different diagnosis. One practice said she was far-sighted. Another claimed she was near-sighted. Yet another said she had astigmatism.

Another decoy patient, an attorney who suffered from glaucoma and strabismus, saw three top "oculists" (i.e., ophthalmologists) in New York before going undercover. After visiting 41 different optometrists, "he got not one single correct diagnosis of his eye trouble!" the article states.[1] Thirteen optometrists gave the attorney no response when he told them about his condition, while five "nodded amiably" but then proceeded as if it made no difference. Yet others stated the attorney's eye problems were due to "shadows" on the patient's lenses or a "tired cranial nerve." One even attributed his glaucoma and strabismus to abnormal brain patterns and "immoral thinking."[1] In total, 24 of the 41 new glasses prescribed to him by optometrists were deemed incorrect by oculists.

"If the eye were merely a refracting apparatus—something that properly-fitted glasses could correct—the optometrists would fit far better into the scheme of things," Riis wrote with evident disdain. "But this complicated and delicate organ is more than an arrangement

of lenses existing apart from the rest of the body." Rather, it's "a subtle barometer of general health" that can reveal systemic diseases. "Competent eye examination may give you notice of some such condition in time to permit early treatment. An optometrist's examination may, as our survey shows, equip you merely with a pair of futile glasses and leave you ignorant of a serious menace to your health."[1]

Riis demonstrated his point by bringing along an ophthalmologist—his profession kept mum—to pose as a patient for one visit and pretend to have a brain tumor, syphilis and glaucoma. The optometrist told him he had eyestrain, sold him a new pair of glasses and "gave him a bottle of eye-wash to dispel one of the most dangerous afflictions that can beset human life!"[1]


THROUGH THE EDITOR'S GLASSES

"Yes, Optometry Is on Trial"

Maurice Cox's editorial, going toe-to-toe with *Reader's Digest.*

Unfortunate though these missed calls surely were, many in optometry felt this was no mere investigation. It was a sting operation.

OPTOMETRY REACTS

Condemnation was swift. Just a week after the issue hit the newsstands, *The Optical Journal-Review* informed its readers about the article and helped to put it in perspective. "The article contains some truth, but it also contains some half-truths, a good deal of exaggeration and generalization, some statements that are manifestly unfair and some that are positively silly," *OJRO* editor Maurice Cox wrote in the August 1, 1937 issue.[2] He also opined that the author had stacked the deck by comparing the work of department store optometrists to that of a few preeminent ophthalmologists. "These three men top their profession," Riis wrote of his experts.[1] "We venture to say," Cox retorted, "that the findings of any 41 oculists would very likely differ from the prescription worked out by the three top-rung oculists."[2]

Still, Cox and other leaders in optometry did admit that some of the criticism was warranted. "Optometry knows there are abuses in her field. She knows she has her share of incompetents, just as has medicine, dentistry, law and the other professions," Cox wrote in his editorial. "Optometry is cleaning house—it has been doing it, steadily, gradually, for a long time. Educational standards have been raised and will probably go higher; stress has been placed on the recognition of ocular and systemic pathology; the aid of medical men has been enlisted for both undergraduate and graduate study; State Optometry Boards, in many instances, have set up minimums of equipment and examination routine."[2]

Those advancements were already well underway when *Reader's Digest* turned its investigators loose. Like an adolescent in the midst of an awkward and unflattering puberty, optometry was embarrassed to have its maturation exposed to public scrutiny. While the publicity may have come at an inopportune time, Cox exhorted the optometric field to "look upon the *Reader's Digest* article as a spur, cruelly applied, which will accelerate her own movement for complete professionalization."[2]

The second half of the exposé was supposed to run the next month, in September, but due to a flood of telegrams, long-distance calls, pamphlets on optometry and letters by the hundreds that were sent to *Reader's Digest* about the article from physicians, oculists, optometrists, opticians, state officials and even the Better Business Bureau, the magazine held off on publishing the second story until further investigation could be done.

Instead, an "editorial interlude" ran in the September issue, summarizing the controversy and sharing several responses the magazine had received from both supporters and detractors. "Mr. Riis's article oversteps all limits of decency and good taste. A more biased, a more slanderous article I have never as yet read," one Pennsylvania optometrist wrote. "I classify it as nothing more than pure, unadulterated propaganda for a group of starving oculists who have steadily throughout the last few years been waging a losing battle to hold the goodwill of the public in competition with the growing profession of optometry."[3]

The *Digest* concluded its interlude by quoting three full paragraphs of Cox's Aug. 1 editorial in *OJRO*—in which he laid bare optometry's ongoing evolution—before teasing readers to look for the sequel next month.

As heated correspondence flashed across the pages of *The Optical Journal-Review*, some, like the Pennsylvania optometrist, viewed the *Reader's Digest* story as a hit piece on optometry, while others saw it as an opportunity to rein in the unscrupulous part of the profession. "Tightening up of optometry laws throughout the nation, in efforts to purge the profession of racketeers, is seen as the beneficial result of 'Optometry on Trial,' the article in the *Reader's Digest* that has caused an uproar among optometrists," an editorial in the *OJRO* summarized.[4]

Such was the opinion of optometrist Earle Sterzer, secretary of the Ohio State Optometric Association. "We have been waging a fight in Ohio for the past five years to eliminate the so-called racketeer. We have had numerous cases brought into court and they have been successfully prosecuted," Dr. Sterzer wrote. "The article in *Reader's Digest* was unfair, inasmuch as it was biased and made no differentiation between the racketeer and the legitimate optometrists. It indicated that an oculist is above reproach and an optometrist is not. However, the article has awakened the legitimate optometrist to the real situation, and we should see a wave of legislation throughout the country in efforts to tighten up the optometry laws."[4]

That September 1937 issue of *The Optical Journal-Review* was filled with more articles, letters to the editor and editorials also calling out the *Reader's Digest* article. "We believe that the intended effect of the first article is largely lost on the public that the editorial interlude tends to nullify it," one editorial suggested. "The fact that there was a 'storm of controversial correspondence' indicates to the public that there are two sides to the story and the public will continue to make its choice as it has been doing actually these many years."[5]

DAMAGE CONTROL

The issue became so heated that the AOA stepped in. The AOA president at the time, Harry E. Pine, immediately sprang into action and requested a meeting with *Reader's Digest*, and it was granted. Dr. Pine met for seven hours with the associate editor in charge of the article, and when the second part of the series came out in October, the anti-optometry tone had softened a bit.

"While the author sticks to the thesis that he set up in the first article and gives a strong appearance of holding his ground, a careful reading of the sequel will show that a modified note is struck," an editorial in the October issue of *The Optical Journal-Review* said.[4]

Riis conceded in the second piece that "optometrists who use blatant advertising, who fill their shop windows with show words and scare copy about your sight and health; who flaunt neon signs, who offer free examinations, bargain prices, easy terms. Who tempt you with 'the latest and smartest frames;' who work in shops or large stores selling all sorts of merchandise—these are condemned by their own ethical and competent colleagues in optometry. The latter deserve your supports."[5]

The second story in the "Optometry on Trial" series concluded with a call to action: that "the optometrists raise their standards and drive out all commercialism from their ranks; that they and the oculists try to settle their differences, stop quarreling about jurisdiction over the human eye, and seek to cooperate in working out a program primarily for the public's good."[5]

Still, in the pages of this magazine, all wasn't forgiven. In a series of detailed letters and editorials that ran in the October issue, a common consensus was that optometry was already cognizant of its challenges and was well on the way to working them out.

"Above all, the greatest unfairness lies in the fact that Mr. Riis has undertaken to expose the weaknesses of an infant profession that is gradually working its way to maturity," said an editorial in the October *OJRO*. "A further fact is that optometry is fully aware of its own shortcomings and has been steadily working to correct them, pulling itself up by its own bootstraps, so to speak, with no thanks to the medical profession, and little support from the public. Whenever Mr. Riis quotes from optometric sources to prove his point, he proves also that optometry is fully aware of the evils that need correction."[6]

Cox may have summed it up best: "As we see it, Mr. Riis and the *Reader's Digest* have erred in that they have tried to pillory a profession that is diligently trying to work out its own destiny," he wrote. "Optometry has been smarting under the lash, but no doubt she will soon forgive. But if she is wise, she will not forget the lesson that Mr. Riis has brought. If optometry's house is to be in good order, she will withstand the strongest blasts come what may." ■

1. Riis RW. Optometry on trial. Reader's Digest. Aug. 1937;31(184):77-85.
2. Cox ME. Yes, optometry is on trial. Optical Journal-Review. Aug. 1, 1937:22.
3. Optometry on trial—an editorial interlude. Reader's Digest. Sept. 1937;31(185):100-102.
4. Optical Journal-Review. Sept. 1, 1937:11, 21.
5. Riis RW. Optometry on trial—II. Reader's Digest. Oct. 1937;31(186):96.
6. Optical Journal-Review. Oct. 1, 1937:24-25, 28.

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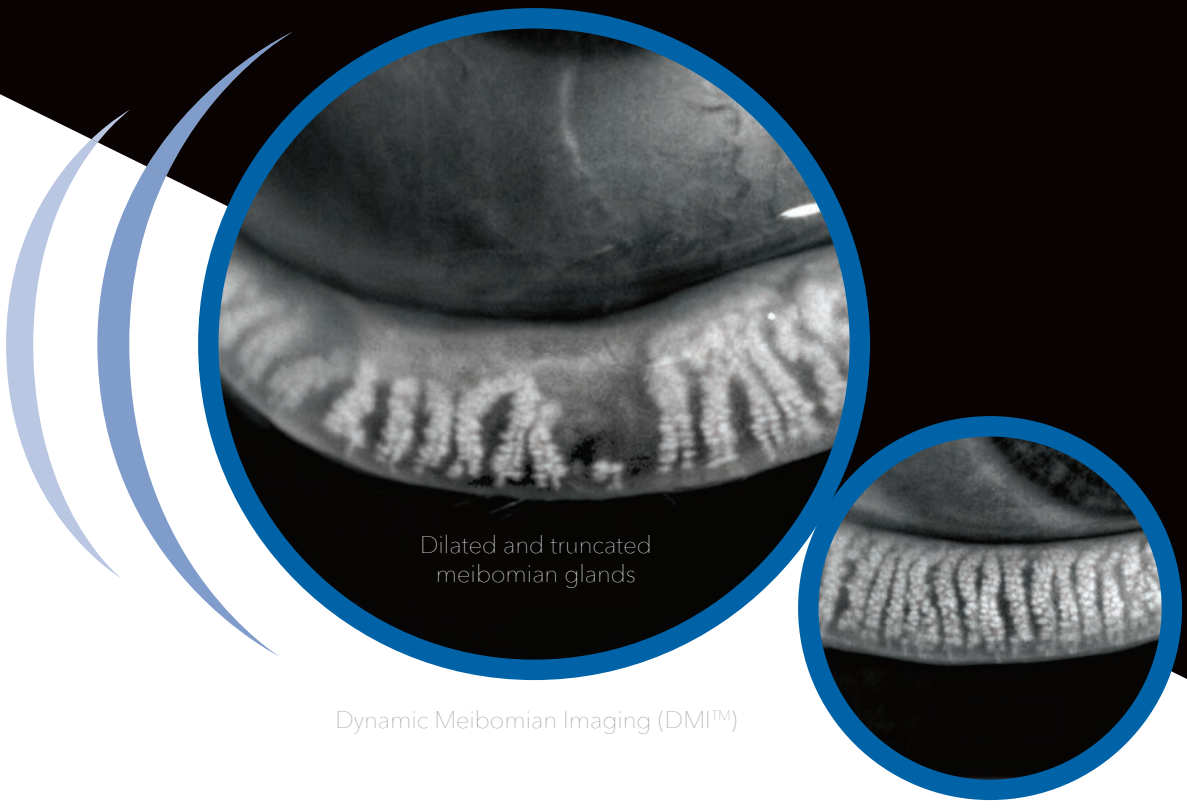

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HOW COMANAGEMENT REINVENTED OPTOMETRY

A pioneer looks back on the conflicts and conquests that unfolded as ODs and MDs established an uneasy new collaboration.

BY MICHAEL RIVIELLO, ASSOCIATE EDITOR

The tempestuous relationship between optometrists and ophthalmologists historically favored MDs because of their positions of power and prestige in the medical community. ODs who referred patients to a local ophthalmologist most often lost them as the MD practice—either through willful deceit or just simple inertia—took over. But the tide began to turn in the early 1980s as intrepid optometrists pushed back, demanding a role in clinical decision making commensurate with their ever-increasing skill set and burgeoning ranks.

The Omni Eye Centers were in the vanguard, with an audacious business plan that put optometrists in charge—and ophthalmologists on the bench, to be called in only when needed. In an October 1984 profile, "Optometry's Answer to One-Way Referrals," we looked at this forward-thinking group just as the concept was taking off. In time, comanagement became a household word among optometrists and the two professions worked toward establishing an uneasy truce and a grudging respect for one another.

For this retrospective issue, we sat down with one of its chief architects, Paul C. Ajamian, OD, of the Omni Eye Centers of Atlanta, to reflect on the hard-won gains of recent decades and to speculate on what's yet to come. Dr. Ajamian has also edited a column in this publication for more than two decades that seeks to educate optometrists on the ins and outs of clinical collaboration across professions. Originally called "Comanagement Q&A," the column was renamed "Clinical Quandaries" in 2015 to better reflect the times (*see "Comanagement in Review," p. 104*).

Dr. Ajamian is, of course, also renowned for his role in continuing education as the chair of the optometric education program at the annual SECO conference. Not surprisingly, his efforts there consistently bring in non-optometric experts from ophthalmology as well as other medical disciplines.

Q ***In 1984, you were featured on the cover of* Review *to advocate what was, at the time, a novel concept—referral centers in which primary eye care decisions were directed by optometrists, who engaged the services of an employed MD when they deemed it necessary. It was, in short, a complete reversal of the previous dynamic, in which ODs would refer to ophthalmologists and typically lose the patient. What was the impetus for this concept and how did you and your colleagues settle on that as the business model?***

A Fortunately, the climate has changed quite a bit since the '70s and '80s, leading to a better working relationship with many ophthalmologists. Ralph DiIorio, MD, was on the cover of that 1984 issue as well. Early on he was one of only a handful of allies across the country who truly believed we had a larger role to play. They were criticized and ostracized for "siding" with us, but they stood firm.

Today, those beliefs and relationships are no longer an oddity. MDs working closely with ODs in universities and residencies, VA and group practice settings, are exposed first-hand to our training and clinical expertise. It doesn't take long for them to see how working together can benefit their practice and, simultaneously,

our mutual patients. They learn that, to be successful, it is wise to embrace the comanagement model conceived in the early 1980s. If they don't, their competition probably will, resulting in a career of routine care and occasional surgery.

Q ***It's clear that perceptions have evolved since the early days. Has your own way of thinking about comanagement changed since those early years as well?***

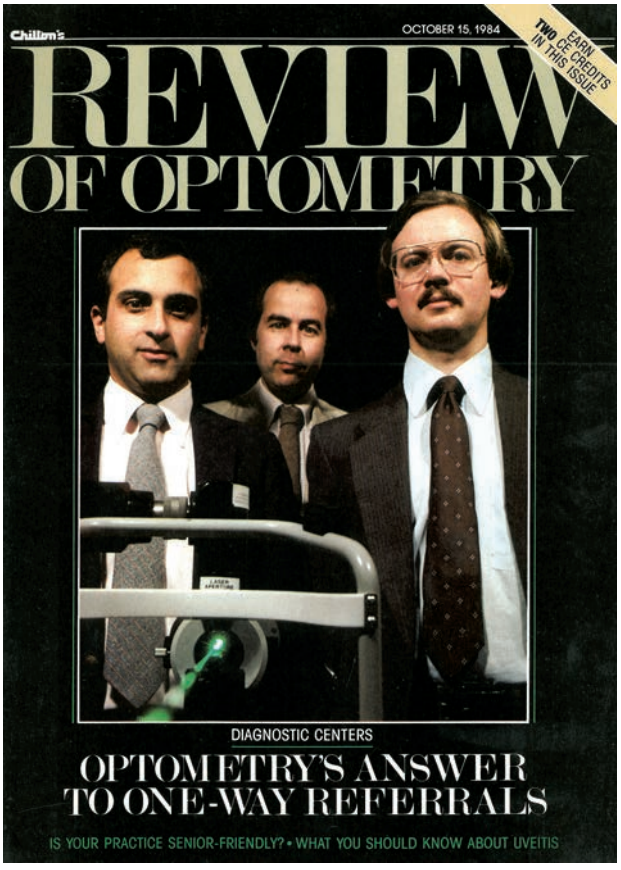
A Not really. I have never forgotten that the group of Georgia ODs who developed the concept, led by the late Dr. Bill Cuthbertson, established the principle of two-way referrals and mutual respect. The practice was predicated on not doing anything that would compete with the referring OD: no optical, no contact lenses and no primary care. Add to that the automatic return of each patient, a meaningful letter back and ongoing continuing education to move the profession forward, and a transformative model was born. Concurrent with the establishment of the comanagement centers was scope of practice expansion, which allowed that training to be applied to patients, with the center acting as a resource and friendly "back-up."

I caution ODs, young and old, to never forget the era of one-way referrals. If comanagement centers remain strong, the competition will play ball. If not, we could see a return to the old days of ophthalmologists who steal patients and bad-mouth optometrists.

We also need to remember that if we don't practice full scope, and if we don't stay involved with Medicare, glaucoma and post-op care—someone else will. They will come in and fill the void. And it may not be ophthalmology.

Q ***Has comanagement helped to elevate the public's perception of the profession? What about the perceptions of physicians—did successfully pushing comanagement help ophthalmologists see the necessity of the profession?***

A It absolutely has. When an optometrist sends to an MD or DO practice that truly believes in comanagement, the optometrist is made to look good, and the patient feels good about the primary care that their doctor of optometry provides. The patient's perception of us is enhanced when they see first-hand that we do more than prescribe glasses. They learn that we handle all primary care—from red eyes to retina—and that we act as the quarterback in the cases that require a specialist.



Comanagement was on the conceptual cutting edge, and at the time was an "answer to one-way referrals," as the article in 1984 billed it.

From the perspective of the MD/DO ophthalmologist, the really talented ones realize that if they want to do what they are trained to do, they need to leave the rest to us. If they want to operate in a clinical niche, they need to let us handle what then lies out of their clinical gaze.

Q ***Do you have any stories regarding what anyone said to you at conferences or in response to your* Review of Optometry *column?***

A Lots of stories, and lots of good feedback to the column over the years, because the cases were "from the trenches"—based on comanaged cases that we can all relate to and learn from.

One thing I still get asked, sad to say, is "How can I set up an Omni-like center in my area?" When I ask why, it quickly becomes apparent that there are still some who do not have a good working relationship with their small, mom-and-pop ophthalmologists close to town.

The local MD tells them comanagement is "illegal and unethical"—a throwback to the '70s and '80s for sure!

Q ***What is the clinical value of comanagement? How can comanagement improve outcomes?***

A As a famous poet once said, "let me count the ways!" Let's use the example of a long-time cataract patient, cared for by one of our many excellent referring docs, with a 30-year history of monovision and toric contacts who wants the same setup after cataract surgery. The OD, who knows the patient much better than anyone ever will, talks to them about the need for a toric IOL and recommends setting one eye for distance and one for near.

The patient has received advice from a practitioner she knows and is happy with the plan. That plan is then clearly conveyed to the surgeon, who gratefully accepts and implements it! The result: saving time and confusion, and alleviating the intimidation factor for patients of having to decide during a five-minute first encounter with a surgeon they don't know.

The benefits continue after the surgery, because the patient can get all their post-op care close to home and from a familiar face. From the OD's perspective, not only do they have a happy patient, but it was also not necessary to introduce her to a competitor with an optical down the street! The value of comanagement has been well proven over the past 40 years, but it has taken some a little longer than others to recognize that it is here to stay.

Q ***What happens next? Are there new frontiers for optometry to push, or will it suffice to just continually refine the current model of care?***

A New frontiers will always exist, and if the next generation is interested in exploring them, it all starts with membership in their state association and AOA, followed by contributions to local and AOA PAC and the establishment of relationships with state representatives and senators.

Remember: We are a legislated profession, and the original comanagement centers were leaders in the effort to educate and then legislate, and still are; but we need every optometrist to get in the game—not just watch events unfold from the sidelines.

Q ***Does optometric practice in 2016 match what you may have envisioned for it back in 1984?***

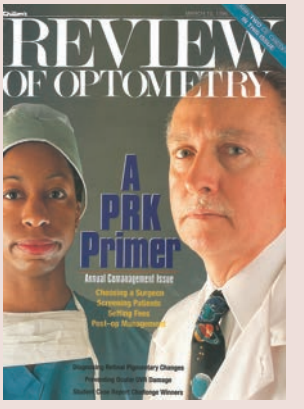
A Great question! It's what we dreamed. With a lot of hard work, state-by-state, we achieved the expansion in our scope of practice. I remember the old days of having to refer a patient to an ophthalmologist for dilation! Fast-forward to today, we can dilate anyone—but do we act on our hard-fought rights? Some ODs are actually teaching patients that dilation is a negative by offering a "better and faster" instrument for $40. Let's use what we worked so hard to get, all of which starts with dilation! ■

Comanagement in *Review*

To help advance the cause of OD-MD collaboration, this publication launched an annual comanagement issue in 1996 that ran for 20 years. From its inception, the forward thinkers of the profession have spoken on topics such as fee setting in post-op management of PRK patients and maximizing patient outcome through comanagement do's and dont's. In fact, the first annual comanagement issue featured a comprehensive how-to within the context of PRK. We've since retired the name—but not the coverage—as the concept no longer functions as a responsibility limited to select cases. And Dr. Ajamiam's long-running Q&A column on clinical challenges—designed to show comanagement within the context of real clinical cases—dropped the overt use of the word comanagement last year.

Consider this analogy: in a previous era we may have published an occasional article or two on how an optometrist could incorporate a computer into practice. It was a distinct concept, both intellectually and practically. Today, use of computers is pervasive—and so is comanagement, baked right into the training and expectations of new ODs entering the profession. Contemporary optometrists are (or should be) comfortable ordering an MRI and consulting a neurologist, taking referrals from a pediatrician for childhood vision problems, discussing glucose levels with a patient's GP or endocrinologist and referring to an ophthalmologist for cataract surgery, with an OD-recommended IOL accompanying the referral.

In short, comanagement won. And then we retired its jersey.



Our first comanagement-themed issue in 1996 tackled a familar concern of the era: how optometrists can survive refractive surgery.

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REFRACTIVE SURGERY IN RETROSPECT

ODs once feared this threat to their livelihoods, but its boom and bust left optometry smarter and stronger. Here, we look at the sentiment then and the reality today.

BY ALIZA BECKER, SENIOR ASSOCIATE EDITOR

Imagine being a typewriter salesman at the dawn of the personal computer revolution, staring down the threat of a disruptive technology that might render your product obsolete. That's how some optometrists started to feel in the 1990s, when the concept of refractive surgery finally shifted from oddity to reality. For a century, optometrists had been the go-to representatives for refractive eye care, which, until that point, meant the dispensing of glasses and contact lenses. The picture suddenly changed in 1995 when the FDA approved the excimer laser for photorefractive keratectomy (PRK). Boosters talked breathlessly about how this could eliminate the need for corrective lenses forever.

From the start, questions abounded on what this new subfield of eye care meant for optometrists and their patients.

"There's a lot for optometrists to be concerned about and very few clear answers at this time," said Michael Moretti, editor of *Medical Laser Insight*, in *Review*'s October 1995 article on incorporating PRK into the optometric practice. "There will be PRK centers established on the optometrists' 'turf.' Individual practitioners need to make some strategic decisions."

"The more I've looked into the PRK industry, the more apparent it's become that these companies are operating from this assumption: whoever owns the laser is in control, and whoever is in control gets the lion's share of the fees," said Jack Melton, OD, in the same article.

Things got even more heated—and public interest boomed—when the FDA approved an excimer laser for performing intrastromal keratomileusis (LASIK) in 1998. The much-lauded LASIK procedure was under the sole domain of ophthalmologists, and largely eliminated the need for postoperative correction. *(See "Laser Refractive Surgery Through the Years," page 109.)*

It looked like optometrists might get cut out of the picture entirely.

To make matters worse, another problem had arisen at much the same time: the field of ophthalmology was undergoing increasing specialization, which placed further pressure on its members to enter this new area of eye care.

"Increasing competition for surgery and general eye care is changing the structure of ophthalmology," noted an article in *Review* a decade before the 1990s refractive surgery boom ("Ophthalmology's Fragmented Future," February 1987). "Thanks to increasing pressure on health care costs, pre-paid providers are controlling a greater and greater share of eye care and eye surgery," the article noted. "To cut costs, these providers are now experimenting with taking eye care and eye surgery away from the average ophthalmologists and channeling it towards circles of optometrists surrounding one or two specialized surgeons."

Even ophthalmic surgery itself was becoming more specialized, which was causing specialists to eat up business. Ophthalmology's 85 residency programs were pumping out 500 ophthalmologists per year at that time, which crowded the field even more. In addition, medications were becoming increasingly

Refractive surgery was a hot topic as ODs pondered their role in delivery of care.

regulated and the level of optometry education was growing, which further threatened ophthalmology.

The discipline of laser surgery seemed like the perfect place for industrious ophthalmologists to move into, especially given the growing patient interest.

And move into it they did. "Look at attendance at ophthalmologists' continuing education courses; the laser courses are jammed," noted George White, OD, in a September 1989 article.

CAN'T BEAT 'EM? JOIN 'EM!

So what were optometrists to do?

Some stayed out of the game entirely: in an October 1995 survey of 500 *Review of Optometry* subscribers, 62% reported no affiliation with a laser center and no plans to join one.

Other optometrists tried to get in on the action (not to mention protecting their patients) by taking the role as patient educators and advocates. "Consumer interest in excimer laser PRK is already high, especially among young contact lens wearers, [with] more than half of all potential PRK candidates [interested in seeking] the advice of their regular eye doctor prior to undergoing the procedure," a separate 1995 survey reported.

Still others postulated that "some referring doctors will perform these procedures at the centers themselves, [while] doctors who don't have the skills will

LASER REFRACTIVE SURGERY BY THE NUMBERS

In the early days of laser vision correction, just after LASIK was approved, its popularity exploded—from about 100,000 procedures in 1996 to 1.4 million in 2000—a 14-fold increase in just five years.[1] LASIK had quickly become the most common refractive procedure in the world. But then in early 2000s, the dot-com bubble popped, and the volume of procedures dipped for a few years. In 2004, the number of laser refractive surgeries nearly recovered to that high water mark of the year 2000, but never surpassed it. The numbers plateaued just beneath 1.4 million for the following three or four years. Then in 2007-2008, the housing bubble burst. The economy took a nosedive and laser refractive surgery—typically an elective procedure—followed the plunge. The numbers bottomed out in 2011-2012 at about 600,000 procedures a year, less than half than that of its high point. The number of procedures has edged up a little bit since, but it's clear that laser refractive surgery never fully took over the eye care world, as many people back in the late 1990s had expected it would. "We learned in LASIK to follow the consumer confidence data," said Randall Fuerst, OD, who recounted the ups and downs of his refractive surgery-based practice in a 2012 article. "If consumer confidence rose, almost invariably LASIK volume rose. Conversely, if it dropped, LASIK volume dropped."

1. Statista. Number of LASIK surgeries in the United States from 1996 to 2014 (in 1,000s). Available at: www.statista.com/statistics/271478/number-of-lasik-surgeries-in-the-us/. Accessed July 5, 2016.

WHAT'S NEXT FOR REFRACTIVE SURGERY?

On the horizon are several technologies and ancillary techniques that may help further prevent postoperative LASIK complications while expanding the pool of surgical candidates. Corneal collagen crosslinking is the most notable, achieving FDA clearance earlier this year for this technique, which strengthens the bonds of the cornea and possibly reduces post-LASIK ectasia. Some refractive surgeons are combining corneal crosslinking with LASIK or PRK in non-keratoconic patients as a prophylactic measure to stiffen the postsurgical cornea.

LASEK may yield better refractive results than traditional LASIK in patients with high degrees of myopia, while SMILE—a small-incision lenticule extraction procedure in Phase III trials—may exhibit a lower induction rate of higher-order aberrations and spherical aberration, and less postoperative dry eye, than LASIK.[1,2] The field of laser-guided topography also continues to grow with the expectation of successful use on increasingly irregular corneal surfaces. More sophisticated screening technologies will continue to improve the ability of optometrists to screen refractive surgery patients and educate them about procedure eligibility.

1. AlArfaj K, Hantera MM. Comparison of LASEK, mechanical microkeratome LASIK and femtosecond LASIK in low and moderate myopia. Saudi J Ophthalmol. 2014 Jul:28(3):214-9.
2. Lin F, Xu Y, Yang Y. Comparison of the visual results after SMILE and femtosecond laser-assisted LASIK for myopia. J Refract Surg. 2014 Apr:30L4):248-54.

use the centers to obtain access to trained consultants—much like what we'll see with the excimer PRK centers that are forming around the country."

"This is a logical extension of what optometry has always done," said Jim Thimons, OD, in a 1989 article when asked whether optometry was ready for laser surgery. "Optometry has historically been the profession most knowledgeable about light and light energy as it relates to optics. We don't see this as surgery but as a refractive procedure. Surgery by strict definition is a technique used to cure a disease. Refractive problems are not a disease."

Although ODs have yet to gain authorization to perform LASIK surgery, the prediction that optometrists would ultimately share the spotlight with ophthalmologists wasn't so far off. Today, ophthalmologists continue to be the sole providers of LASIK and other surgical procedures, but optometrists are often responsible for preoperative patient education and postoperative care, including the treatment of dry eye and other complications using topical medications or contact lens fittings. *(See "What's Next for Refractive Surgery?" page 108.)*

Optometrists who embraced the changes wrought by the advent of refractive surgery evolved with it. The sudden appearance of a surgical boom allowed ODs to build up the skills needed to comanage patients. It better integrated them into the fabric of the health care system and broke down barriers with ophthalmology.

"Specialty services and refractive surgery comanagement are where I'm headed," a Washington state optometrist mentioned as part of his response to *Review of Optometry*'s 9th Annual Income Survey in 1995.

BOOMERANG-ING BOOMERS

Fast forward 15 years. By 2010, the fears of LASIK draining patients from optometrists' offices had disappeared. If anything, patients' concerns of LASIK mishaps—widely popularized at the time—had helped to keep patients in ODs' exam chairs. *(See "Laser Refractive Surgery by the Numbers," on page 107.)*

In 2009, the FDA, the National Eye Institute and the Department of Defense launched the LASIK Quality of Life Collaboration Project to determine the percentage of patients who developed difficulties with their daily activities as a result of LASIK.[1]

The study took five years to complete, and the top findings included:

- Up to 45% of patients who had no visual symptoms before surgery reported at least one symptom at three months after surgery.
- Halos were the most common new visual symptom—about 35% of patients developed halos by three months post-LASIK.
- Up to 30% of patients who didn't have dry eye before LASIK reported dry eye symptoms at three months after LASIK.

Although this study quantified the extent of the problems, the results were not exactly unexpected. Optometrists had been hearing such complaints from actual patients for years.

But recently, a new development has emerged in the care of refractive surgery patients.

"Interestingly, many of refractive surgery's 'early adopters' (i.e., those who had a procedure in the mid-1990s) have already reached age 50 to 60, and we are now beginning to see them return with visually significant cataracts and presbyopia," wrote Maynard Pohl, OD, in a November 2013 article.

All this just goes to show that there may be some truth to the adage: "Everything old is new again." Or perhaps in the case of laser refractive surgery, it should be: "Everything new grows old someday." ■

Thanks to Joseph P. Shovlin, OD, of Northeastern Eye Institute and Eric Donnenfeld, MD, of TLC Laser Eye Centers, for assistance with this article.

1. U.S. Food and Drug Administration website. LASIK Quality of Life Collaboration Project. Available at: www.fda.gov/MedicalDevices/ProductsandMedicalProcedures/SurgeryandLifeSupport/LASIK/. Accessed July 5, 2016.

LASER REFRACTIVE SURGERY THROUGH THE YEARS

• **1896.** Surgical alterations to the eye began to be seriously considered in this year when Lendeer Jans Lans, an ophthalmology teacher in Holland, published theoretical work on the potential for cutting the cornea to correct astigmatism. Two years later, Lans incorporated electrocauterization to heat the corneal stroma in an attempt to alter its shape. This technique was later adopted under the name thermokeratoplasty in 1975.[1,2]

• **1949.** The "father of refractive surgery" ophthalmologist Jose Ignacio Barraquer, MD, of Bogota, Colombia, published an article on the concept of lamellar refractive surgery, in which the addition or subtraction of lamellar tissue could modify the cornea's refractive power. Dr. Barraquer invented a small handheld keratome, similar to a carpenter's plane, which he used to resect layers of corneal tissue.[3,4]

• **1974.** Russian ophthalmologist Svyatoslov N. Fyodorov, MD, inadvertently performed the first radial keratotomy procedure on record when he removed glass shards from the eyes of a boy who had fallen off of his bicycle. The rudimentary procedure employed a series of manual cuts that ultimately led to a reduction in the boy's nearsightedness.[5]

• **1981.** Excimer laser technology was introduced to the field of vision correction when Rangaswamy Srinivasan, PhD, a scientist at IBM, discovered that ultraviolet light emitted from an argon-fluorine (ArF) excimer laser could be used to precisely ablate fine layers of living tissue with little to no damage to the surrounding area.[6] His first test of the laser was on bone and cartilage from his leftover Thanksgiving turkey, in which he proved that the excimer laser could make precise cuts without burning underlying material.[7]

• **1983.** In collaboration with Dr. Srinivasan, Stephen Trokel, MD, an associate professor of ophthalmology at Columbia University, performed the first excimer laser photorefractive keratectomy (PRK)—which he termed "ablative photodecomposition"—on cow and cadaver eyes.[8]

• **1988.** Working with Dr. Trokel, Marguerite McDonald, MD, of Louisiana State University, performed the first PRK procedure on a normally sighted eye in a living human subject—a 61-year-old patient who'd been diagnosed with malignant melanoma.[9]

• **1989.** The idea for LASIK appears in two separate places at the same time. Greek ophthalmologist Ioannis Pallikaris, MD, PhD, described the basic technique we now call LASIK, in which the surgeon uses a microkeratome to create a corneal flap prior to application of the excimer laser, as in PRK; he performed the first procedure on a human eye that year.[10] Meanwhile, in New Orleans, Gholam Peyman, MD, applied for and received a patent for a similarly described procedure.[11]

• **1995.** The FDA approved the first excimer laser for PRK, Summit Technology's Eximed System.

• **1998.** Ophthalmologist Fred Kremer, MD, received FDA approval for the first excimer laser system indicated specifically for LASIK.

• **2001.** The FDA approved the first bladeless femtosecond-assisted LASIK system, made by IntraLase. Investigators have found bladeless LASIK to be just as safe, predicable and stable as conventional LASIK, but better in terms of efficacy and safety.[12]

• **2002.** Following its introduction with PRK in 1999, wavefront-guided analysis for LASIK was approved for customized correction.

1. Roy FH. Master Techniques in Ophthalmic Surgery. 2nd ed. New Delhi: Jaypee Brothers Medical Publishers (P) Ltd; 2015:855.
2. American Academy of Ophthalmology. History. Available at: www.aao.org/bcscsnippetdetail.aspx?id=08e06aae-9ab9-4972-954b-f77b3b7b7150. Accessed March 31, 2016.
3. Agarwal A, Jacob S. Refractive Surgery. 2nd ed. New Delhi: Jaypee Brothers Medical Publishers (P) Ltd; 2009:3-4,115.
4. Reinstein DZ, Archer TJ, Gobbe M. The history of LASIK. J Refract Surg. 2012 Apr:28(4):291-8.
5. American Society of Cataract and Refractive Surgery. Svyatoslav N. Fyodorov. MD. Available at: www.ascrs.org/honorees/svyatoslav-n-fyodorov-md. Accessed March 31, 2016.
6. American Institute of Physics. Prize for the Industrial Application of Physics—Rangaswamy Srinivasan. Available at: www.aip.org/industry/prize/srinivasan. Accessed March 31, 2016.
7. The Optical Society. How a Leftover Thanksgiving Dinner Gave Us LASIK Surgery. Nov. 25, 2013. Available at: www.osa.org/en-us/about_osa/newsroom/news_releases/2013/how_a_leftover_thanksgiving_dinner_gave_us_lasik_s/. Accessed March 31, 2016.
8. Trokel SL, Srinivasan R, Braren B. Excimer laser surgery of the cornea. Am J Ophthalmol. 1983 Dec;96(6):710-5.
9. McDonald MB, Kaufman HE, Frantz JM, et al. Excimer laser ablation in a human eye. Arch Ophthalmol. 1989 May;107(5):641-2.
10. Pallikaris IG, Papatzanaki ME, Stathi EZ, et al. Laser in situ keratomileusis. Lasers Surg Med. 1990;10(5):463-8.
11. US Patent #4,840,175. "Method for Modifying Corneal Curvature," granted June 20, 1989. Available at: www.google.com/patents/US4840175. Accessed June 15, 2016.
12. Kasetsuwan N, Satitpitakul V, Puangsricharern V, et al. Comparison of performances of femtosecond laser and microkeratome for thin-flap laser in-situ keratomileusis. Lasers Surg Med. 2016 Mar 21. [Epub ahead of print.]

SPEAKING FRANKLY

He fought for his country in World War II and for his profession back home. A conversation with Frank D. Fontana, OD.

BY JACK PERSICO, EDITOR-IN-CHIEF

Few optometrists today are as well known, or as beloved, as "Uncle" Frank Fontana, OD. His influence cuts across generations, with both his contemporaries and younger optometrists expressing admiration and respect for him as a doctor, an educator and a person.

Dr. Fontana, a native of St. Louis, began practicing optometry in 1950 and still sees patients three mornings a week, giving him an astounding and likely record-breaking 66 years in clinical practice. To honor optometry's favorite uncle, I sat down with him to talk about his life story and his many contributions to the profession he dearly loves.

One month shy of his 94th birthday, Uncle Frank is as sharp and funny as ever.

Can you tell me about your life before optometry?

My dad came from Sicily and settled in St. Louis. He had been in World War I and was a very patriotic guy. He taught my brother and I, right from the beginning, to appreciate living in the United States and our lives here because it's full of opportunities. He was a very hard working guy. He wanted his boys to go to college, so he made sure my brother Eddie and I had that chance. Then both of us got caught by World War II—but we wanted to go and serve. I had finished one year of college before going into the service. I went into the Army January 4, 1943 and was in the service 35 months. Twenty-eight of those months were in Europe.

Basic training mainly consisted of walking like crazy, building your endurance up. But the interesting part about that was that, after you finished training, a new unit would be created—we were just building up our military at that time. This new organization started and it was called the 93rd Medical Gas Treatment Battalion. And by "gas," they meant poison gas. They needed 500 guys, so they just picked the first 500 names. It didn't matter what expertise you had, if you had any. So that's how I ended up in the medical corps! It had none of my aspirations at the time.

Our outfit was the first of its kind. We were in a portable hospital unit, treating poison gas by washing it off soldiers who had been exposed. We would take care of a whole division of infantry, which is 16,000 to 17,000 men, so we had to travel fast.

Later in the war, I was promoted from private first class to staff sergeant and reassigned to England. I spent July to November 1943 in Oxford, and we went to London often. The Battle of Britain was already over by then, but there were still no lights allowed in case of attack. Imagine Piccadilly Circus totally black! What a sight. I still remember walking around London in the dark, lit only by fluorescent strips that pointed down at street level but couldn't be seen from above.

Not quite a year later, while I was stationed in Southampton, I went for a walk one morning and I heard this incredible roar in the air. I looked up and an armada of planes went right over us. That day was June 6, 1944, otherwise known as D-Day. Southampton is just across the English Channel from France and those were our planes going in for the attack.

How did you get into optometry?

In the Army, I was exposed to a lot of medical people.

So I decided I wanted to do something medical after the war. At the time, medical school was eight years, dentistry was six years and optometry was four.

Back in St. Louis, my dad worked in a department store as an ice cream maker, and his best friend was the store's optometrist. So, my dad brought me in to meet him. "It's a clean profession," the optometrist told me. "You make people see. You would like it if you went into it." So that's what I did. I was 23 at the time.

I enrolled in what was then called Northern Illinois College of Optometry, in Chicago. It was a four-year course, which was rare at that time. A lot were still just two years. And being a veteran, the G.I. Bill paid for all of it—books, tuition, everything. That was such a wonderful program that really did so much for our country.

What was optometry like when you entered practice?
Busy! A huge number of optometrists had descended on every state, because the schools were putting out so many at that time.

I don't think optometry would have improved as much and made the strides it did without the G.I. Bill. It added so many talented people to our ranks at just the right time for what the profession was taking on then. Optometry as it's practiced today—treating pathology and such—really started with our generation. We were the first ones that got an education on anatomy and pathology in school, along with the usual vision and optics.

Contact lenses as we know them now didn't really exist yet. In school, we had read things about them. But as far as fitting them, we had no idea. All we had was scleral lenses. I remember we each molded someone's eye and then they molded you. Boy, I never said so many Hail Marys in my life as when they stuck that lens in.

It's funny, life is a matter of luck a lot of the time. Two years after I graduated, I was having trouble financially—there wasn't really anything there for me just yet. My mother was going to an ophthalmologist for care and she got me in to meet him. So I offered to do all his refractions for him, and he could do the medical part. He agreed and that's what I did. So, that's how I got interested in pathology, because I saw it all the time.

But you also had your own optometry practice too, right?
Yes, I would be at the ophthalmology office in the mornings and in the afternoons I was building my own practice. But I have to say, optometry was boring at that time. It wasn't exciting at all. We just didn't have much to do. Contacts didn't exist yet. And I wasn't busy then.

How many patients would you see in a day?
Maybe four! *[laughs]* Six on a busy day. It just took time to build up a patient base. People didn't know what an optometrist was. They knew that it had to do with optical devices in some way, but they still associated us with jewelry stores. They didn't know our capabilities.

When did things start to pick up?
In 1957, when we discovered contact lenses, thanks mostly to Drs. Wesley and Jessen from Chicago. They were fascinated by this stuff, and they taught us all to fit them. By the way, the early contact lenses were all PMMA materials and the diameter was 9.2mm with a 4/10th bevel and an optic zone of about 7.8mm. We went through all kinds of diameters—up to 11.2, down to 8.7 and so on—and we ended up right back at 9.2. That's still the average diameter today.

Then in 1961, a young ophthalmologist in town was looking to get in touch with an optometrist. He asked four different optical stores who they recommended, and they all said me. So I worked with him, and that's what really built my practice. His dad had started the ophthalmology center at Washington University, and I became their contact lens guy.

What sort of equipment did you use then?
Not much. A phoropter, retinoscope, ophthalmoscope and a very crude keratometer that wasn't any good. We had a slit lamp too, but it was terrible. It was so rudimentary and so new that about all we could do was turn it on.

What would you do if a patient came in with a problem that was more medical, like an infection or a foreign body?
One of the lucky things in my career is working with ophthalmology. They gave me their consent to use an anesthetic if I wanted, to tide the patient over until I got them to the ophthalmologist. At that time, we weren't licensed to do this, so *[pause]* well, the state board can go after me now if they want, I don't care. *[laughs]*

But I learned so much from being with those ophthalmologists. It was like going to school every day. We did so many aphakics, since it was a surgical practice. We would fit them in contact lenses. That's really how I got into learning the value of contact lenses for people, since they made such a difference for aphakic patients. This was the time before intraocular lenses. The post-cataract glasses were so thick and hard for patients to wear.

So, you got interested in contact lenses because they could help post-cataract aphakic patients?
No, I got into contact lenses because I was bored with optometry. I hate to tell you this—I'm being very candid—but it was so boring. We didn't have the right instruments and we couldn't do any more than refraction. So when contact lenses came along, I jumped at the opportunity. It was so different and so interesting.

And being with the ophthalmologists was a real blessing then because they didn't want to fit them. They didn't even believe in them.

Do you remember fitting your first patient?
Yes, I do. I was scared to death. And so was she.

When a patient would come in for follow up, we didn't have much we could to do other than use fluorescein and a crude black light, so we did keratometry. And we started noticing something: it was changing. We didn't know what that meant. We had a lot of patients who developed astigmatism from those early lenses. It was a learning game for all of us. We had study groups and so on, to share our experiences and ideas.

Who were some of the people who influenced you then?
Oh, so many great people made a difference to my generation of optometrists. Linda Casser, OD, was a wonderful teacher. She taught us about pathology and made us feel comfortable with it.

Lou Catania, OD, was the one of the first optometrists who really got us into treating eyes. He would always lecture on it, and a lot of the message was about having courage.

In the same way, Jimmy Bartlett, OD, and of course Randall Thomas, OD, and Ron Melton, OD, all gave us not just education on how the drugs worked, but

also helped us gain the confidence to use them. It's one thing to know how drugs work, but when these guys shared their experiences, we could imagine ourselves doing it too.

Brien Holden was both a brilliant man and a wonderful person to be around. He was a force to be reckoned with and a good friend of mine. He's the one that made us for real. Not only did he give us courage, he was a role model. He was an optometrist, a teacher, a PhD and a researcher. He made optometry a real profession and got us more respectability than anyone. He was like a marble bust on a mantel to us.

Irv Bennett, OD, was a big influence too. Irv is a very smart man. He taught us how to be businesspeople. In fact, he got my career as a speaker started. He would invite me to talk at his OptiFair meetings and he literally made my career because of it. He would list the speakers in the ads for the meeting and that got our names out there.

You did become a fixture on the lecture circuit, and even helped to found the Heart of America conference, is that right?

Yes, I was close with Jack Hartman—who was first an OD and then an ophthalmologist—and the others who got it started. There wasn't really very much good education yet, so they decided to get all of us together to share our knowledge. We only had something like 30 attendees at the first meeting in 1962. And probably 20 of them were from industry. Nowadays, the meeting draws 800 doctors every year.

And then a few years later you started the AOA Contact Lens Section, too. How did that happen?

That was a hard one to do. I was the AOA's contact lens committee chairman, and my allowance was $200 a year. That didn't amount to much to devote to contact lens education, so I talked with them about an idea for a new section. We had a regular speaking group that went to all the meetings and we would always ask people if they would be willing to sign up to join a new section, so I knew we would have people interested in it. I asked the AOA to put the idea before the board—and they voted it down. It would be too costly to run. But I told them we wouldn't need it—I already had a list of 300 people who had already made a pledge to contribute. So I wrote to everyone, and every single one of them sent a check.

What do you think of the current make-up of optometry, with medical topics so much a part of it?

My generation really distinguished itself by taking on disease treatment in addition to all our traditional duties. And we made contact lenses a success. But I think we're going too far by getting interested in surgery. It's not the same profession. I think what we optometrists do—like the department store clerk told me all those years ago—is that we make people see. That's still our core strength. Surgery feels to me to be too far from who we are.

I am impressed with the young optometrists because they're so smart. They have better training than any of us who came before could have dreamed of. They have great opportunities ahead of them.

Any final thoughts on what helped you to succeed that would be a good lesson for younger doctors?

The biggest thing is to not put yourself above the patient. I've always treated my patients like friends, never with haughtiness like some doctors feel entitled to do. You can be very friendly and close to your patients without being too personal. Early in the game, we sometimes used to get too personal. Back in the '50s, I used to have people call me to ask me to solve their kids' geometry problems over the phone. *[laughs]*

My advice is to be nice and be professional without displaying haughtiness—patients will learn to love you. They'll keep coming back and won't go anywhere else. Even today I have patients say to me at the end of an exam, "I'm going to come back in a year. Are you going to be here?" I say "yes," and they're pretty excited about that. ■

A REVIEW OF THE *REVIEW*

Experts in the field reflect on their early contributions to the magazine and how things have changed since.

Though *Review of Optometry* has been the longest-running publication in the field of optometry, this achievement would not have been possible without the continued efforts of our authors—thought leaders who have remained at the forefront of the topics we have covered over many decades. To celebrate them, we asked several for their impressions of articles they authored in a previous era of optometric care to see what they think today of their early work in the field.

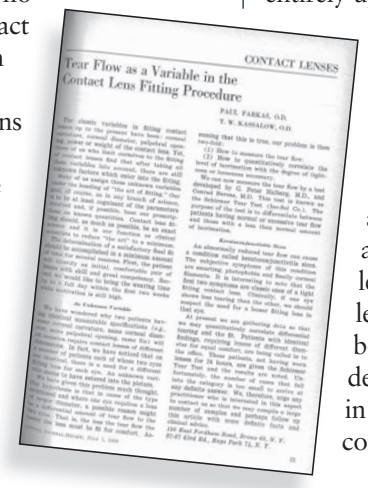
JULY 1960

Tear Flow as a Factor in the Contact Lens Fitting Procedure

By Paul Farkas, OD, and Theodore Kassalow, OD

Today, the buzzword that receives the most attention in the optometric field is "dry eye." Back in 1960, there were plenty of tears—just ask anyone who went through rigid contact lens adaptation then. Even now, there are still a few older patients who remember receiving their rigid contact lenses and are still happy with them to this day.

Back then, the average contact lens exam room consisted of a projector, phoropter (though a trial frame would do), keratometer, possibly the newly introduced slit lamp, an ultraviolet magnifying lamp and fluorescein. Viewing fluorescein patterns and lens movement were an essential part of the fitting procedure. Many practices also had a hard lens trial set.


CONTACT LENSES

Tear Flow as a Variable in the Contact Lens Fitting Procedure

PAUL FARKAS, O.D.
T. W. KASSALOW, O.D.

For most part, it was necessary for practices to have on-site lens modification equipment where contact lenses could be modified according to patient symptoms and needs. The addition of edge treatments or peripheral curve modifications could make the difference between success and failure in lens adaptation. Most contact lens manufacturers were initially small mom-and-pop operations that were eventually absorbed into larger organizations. A second important factor was a motivated patient, one who would stick with the optometrist until they were happy or until all other options were exhausted. Bedside manner and handholding were keys to success.

The contact lens material we worked with then was polymethylmethacrylate (PMMA) plastic. We determined the necessary spherical power, center and edge thickness, base curvature diameter and peripheral curves. At the time, PMMA was available in either clear or light tints. Note that making this product work was entirely up to the OD, and though there was some science involved, it was mostly experience and clinical intuition. The cosmetically unacceptable scleral lens was left in the dust in the forties and fifties; by 1960, the "invisible" corneal contact lens was king.

Concerning the tear issue, the challenge first and foremost was the patient achieving lid adaptation to the lens. Frequently noted problems were onset of profuse tearing until the lens settled and then having to live with foreign body sensation until the lid and cornea were desensitized. Though it sounds primitive, keep in mind that these were motivated patients—contact lenses were still a rarity and novelty—

who had spent several weeks looking down while being reassured by the optometrist that things would improve. Eventually they did. In fact, with a quality lab and proper edge modifications, a remarkable number of patients did quite well.

The next hurdle was improving wearing time. That meant proper movement of the contact lens to allow tears to circulate freely without slippage, which required modifications of diameter and peripheral curves until the patient goal was met. The final challenge was making certain that the PMMA material remained uncoated during the allotted wearing time. Patients had to receive strict instructions regarding cleaning and avoidance of eye make-up and face creams during lens wear.

To summarize, we did not actually worry about tears too much. Teaching patients to blink properly for optimum tear circulation did the trick. However, the need for the cornea to receive enough oxygen is a story for another time. Today, if an OD saw the level of corneal edema that in 1960 we called *central corneal clouding*, which many patients lived with, the present-day optometrist would be shocked and demand that the patient instead discontinue contact lenses altogether. But a motivated 1960 contact lens patient would fight against the optometrist for even mentioning discontinuation of that magic piece of plastic that was custom-designed for them. The present-day patient would simply agree with the practitioner and look for an alternate contact lens modality or consider refractive surgery.

Dr. Farkas edits the discussion board ODwire.org, an online community with over 20,000 members.

Dr. Kassalow is retired in Sarasota, Fla.

JULY 1979

Slab-Off Prism Compensation for Anisometropic Vertical Imbalance Induced by Disease

By Jimmy D. Bartlett, OD

This paper—generated from my early interest in ocular disease, nuclear cataracts and other conditions that could potentially cause high anisometropia—was one of my first peer-reviewed articles. The materials for it came from my clinical experiences in the Veterans Health Administration hospital system early in my career. I had just graduated from optometry school, where, like many other optometrists of the time, I was trained principally in vision correction measures, including management of low vision, aniseikonia and other visual anomalies.

For the most part, optometrists then could be described as general all-purpose practitioners, though some more well-known individuals engaged in contact lens specialty practices. Furthermore, optometric curricula in the 1970s was only beginning to include biomedical education as a standard, with a specific focus on biochemistry, human anatomy and physiology, physical diagnosis, systemic and ocular pharmacology and microbiology.


PRESBYOPE ISSUE

Slab-Off Prism Compensation for Anisometropic Vertical Imbalance Induced by Disease

When this article was published, residency education in the mid-1970s was one of the most notable movements occurring in the profession. This optional advanced clinical training has largely been responsible for the recent generation of numerous "subspecialty" clinicians who have expertise in treating ocular disease, pediatric optometry, binocular vision, low vision and specialty contact lenses.

Furthermore, the inclusion of optometrists in the VA hospital program also had a positive effect on the profession's growth, opening additional channels for practitioners to care for patients with glaucoma, corneal problems and external conditions, in addition to retinal diseases. Overall, the restructuring of the optometric educational curriculum to include biomedical courses as well as the more traditional vision science education along with extensive externship experiences, the inclusion of optometric services in Medicare and many other third-party insurance provider programs, the advent of residency education and access to the Veterans Health Administration system have transformed optometry into a robust primary eye care profession. While challenges continue to exist, these changes over the last several decades have made it so that patients of all ages now receive highly competent and compassionate care from their optometrist.

JANUARY 1981

When You Suspect Glaucoma...

By Thomas L. Lewis, OD

The world of glaucoma has changed dramatically in the 35 years since the publishing of this article. Even though the exact cause of primary open-angle glaucoma and the amount of damage it causes to the optic nerve is still unknown, tremendous advances in our

understanding of the etiology of the disease at the ultrastructural and biochemical levels still have occurred.

Today, the differential diagnosis of glaucoma also continues to evolve. There is a better understanding of risk factors associated with the disease, which allows for the calculation of the probability of developing glaucoma over a five-year period. This has been accomplished via the discovery of new factors such as the effect of central corneal thickness on IOP readings, as well as a much better understanding of the relative risk of well-known factors including intraocular pressure, race, heredity, optic nerve head appearance and ocular perfusion pressure.

The most obvious impact regarding the diagnosis of glaucoma during this time involves technology. New instrumentation allows us to detect change and monitor over time for both structural and functional damage caused by glaucoma. For example, technology like automated perimetry, confocal laser scanning ophthalmoscopy, pachymetry, more sophisticated tonometry and ocular coherence tomography devices now assist practitioners in refining their diagnosis and treatment efforts. Couple this with normative databases and sophisticated algorithms to interpret the data, and we can not only detect the initial damage from glaucoma, but also determine whether clinically significant progression of this damage is occurring. I am sure that new technologies and a better understanding of this disease will continue to advance the care we provide to glaucoma patients.

APRIL 1983

Senile Macular Degeneration

By Sherry J. Bass, OD, and Jerome Sherman, OD

Upon being asked to update our original article about macular degeneration written in 1983, two facts immediately stood out to us. The first was how long we have both been educators and authors; the second was how much of what we said in this article 33 years ago has changed, while simultaneously still staying part of the scope of the standard of care. So, what are optometrists still doing now, and what has changed?

Back in the early 1980s, the condition mentioned in our original article was known as "senile macular degeneration (SMD)" rather than "age-related macular degeneration (AMD)" as it is called today. The condition's cause and pathogenesis was also a mystery several decades ago, though it was believed to be the result of sclerosis of the choriocapillaris and/or loss of function of the retinal pigment epithelium (RPE). Research results released then were mixed regarding the relationship between systemic disease and the development of SMD; additionally, no one mentioned the role of green leafy vegetables, and few of us knew about antioxidants.

Nowadays, although we are still theorizing about the condition's pathogenesis, thanks to ground-breaking research from 2007 we now know that inflammation plays a large role. Other research has also indicated certain dietary trends may also play a role in AMD's development or lack thereof, including the two AREDS studies in particular, which provide evidence-based suggestions for the use of antioxidant neutraceuticals.

The macular pigments lutein, zeaxanthin and mesozeaxanthin are now significant clinical considerations to monitor for in AMD risk, while tests to measure macular pigment optical density have become useful clinical tools that practitioners can now access. Additionally, genetic testing enables us to provide information to patients regarding their risk for progression based on genetic factors, presence of a history of smoking and body mass index values.

Three aspects of managing senile macular degeneration existed: first, one must find and differentiate SMD; second, one must immediately refer those patients with exudative SMD for treatment; and third, one must provide ongoing specialized care and counseling for patients with this disease. That has not changed.

Binocular indirect ophthalmoscopy was typically performed back then to look for elevation, presence of fluid and other macular abnormalities, and is still done today. Additionally, fundus photography was also performed using a 50-degree fundus camera—still done today—and patients were typically referred to a retinal specialist for fluorescein angiography, which is also still done today. However, nowadays, better technologies for the earlier and perhaps more accurate detection of AMD, the progression of AMD and the development of the exudative changes in AMD now exist. Earlier detection and treatment can help save vision and prevent irreversible damage.

Optical coherence tomography (OCT) is now at our disposal, as well as spectral-domain OCT (SD-OCT) for in-vivo imaging of the retina with excellent resolution that is comparable to histological slides of the retina. OCT imaging can help practitioners identify any present drusen, pigment epithelial detachment or serous detachment, which may be due to the presence of choroidal neovascularization (CNV). Interestingly, while standard SD-OCT may not pick up choroidal neovas-

cular membranes in exudative AMD, recently, a newer type of OCT known as OCT angiography (OCT-A) has also become available. This technology can detect possible CNV membranes without the use of dye injection.

Several decades ago, the only way to monitor the progression of atrophic AMD was to perform direct and binocular indirect ophthalmoscopy, as well as fundus photography. In 2016, however, OCT is now being used to detect the progression of atrophy of the outer retinal elements. Fundus autofluorescence is also in use to detect changes that are not evident even with color photography or ophthalmoscopy. These technologies will likely play an important role as drugs that slow or even prevent the progression of dry, atrophic changes continue to arrive on the market.

Regarding the referral system back then, most practitioners would refer their patients to retinal specialists for the treatment of exudative AMD. This is still the case now; however, the only treatments available then were blue-green laser and red krypton laser for the treatment of juxtafoveal and extrafoveal CNV. There was no treatment for subfoveal CNV back then, and thus we had to watch many of our patients' vision deteriorate as the CNV turned into a massive disciform scar. So many lives were affected then. Now, however, intravitreal injection of anti-VEGF agents has changed the destructive course of the wet form of this disease in many patients. Though a chronic and essentially lifelong injection regimen is still currently required to control the condition, the future holds promise for better injection schedules as even newer agents become available.

SEPTEMBER 1985

Easing into Automated Perimetry

By Paul C. Ajamian, OD

It is so interesting to think of automated perimetry, considered so routine today, as revolutionary—but at the time, it was. In the 1970s and early 1980s, manual Goldmann kinetic perimetry was the standard. It took a lot of time, experience and active involvement from the operator and created angst in many patients as well. The early Omni comanagement center directors all paid their dues by doing many 5 isopter Goldmann fields!


EASING INTO AUTOMATED PERIMETRY

The 1985 article covers several topics, including supra-threshold screening perimetry in comparison with threshold tests. I still believe in screening perimetry, though it is rarely used. If you are testing for retinitis pigmentosa, headaches or a hemianopic defect from a stroke, there is nothing better and faster than a supra-threshold screening field such as an 81 or 120 full field. However, most offices are in "threshold mode" and order a 24- or 30-degree threshold field for everyone and everything—not always necessary, for sure.

The article also mentions that it typically took 12 to 18 minutes per eye to perform 30-degree testing—something which newer technology and ongoing research has altered to 24-degree testing performed in just a matter of minutes. That duration of testing wouldn't fly in today's busy office, nor would patients tolerate it well. Additionally, the early automated units cost $10,000 or less, compared to today's price tag of well over $20,000, even with a trade-in.

It is fun to look back knowing that our early automated perimeters seemed like something out of a science fiction movie, but they served as the foundation upon which today's modern instruments were built.

FEBRUARY 1986

Targeting Extended Wear Trouble Spots

By Joel A. Silbert, OD, and Frank D. Fontana, OD

Joel: It was an honor to have been included in the forum 30 years ago on extended wear led by "Uncle" Frank Fontana, as well as the late Roger Kame, Rex Ghormley and Jack Solomon, and two young lads (Ken Lebow and yours truly). It was also interesting to read the transcript of that session in which both hydrogel extended wear and the newer modality of gas permeable extended wear was discussed. As promising as GP extended wear was—in part based on its higher safety profile—it never really took off, mostly due to discomfort issues associated with GP lens wear. The irony today is that GP extended wear is routinely used in orthokeratology treatments and is highly successful.

Thirty years ago, traditional orthokeratology was unpredictable and not highly effective: it took the development of high Dk polymers, reverse curve technology and corneal topography to make it the highly successful mainstream option that we enjoy today. Much of the discussion during that forum revolved around concerns of complications from hydrogel extended wear and patient noncompliance. There were indeed many complications that

resulted from 30-day extended wear with hydrogel lenses, including many cases of corneal edema from snugly fitting lenses. Today, in contrast, we can look back and take comfort in knowing that polymer science has essentially eliminated certain complications of extended wear. For this, we owe gratitude to the science involved in the Nicolson patent that led to the development of the silicone hydrogels that many of us take for granted today.

Despite the advent of these products, many modern practitioners still face challenges with silicone hydrogel extended wear that are not specifically edema-driven, but rather are caused by ocular surface issues and/or bacterial adherence. These include contact lens papillary conjunctivitis (CLPC), infiltrative keratitis, contact lens-induced acute red eye response (CLARE) and microbial keratitis. Although the severity of these complications is tempered by silicone hydrogel lenses, they still exist. Furthermore, patient compliance issues still exist and, as such, many of us see benefits stemming from daily disposable lens wear that were not in existence 30 years ago. Many patients enjoy the convenience and good eye health associated with these products, which are now in ready supply. Daily lenses have also led to greater use of contact lenses by children and teens, helping to allay fears of noncompliance by these groups of patients. Thus, there is less need for extended wear.

Frank: In those days, we had to be careful of who we chose as a patient. You couldn't be too sure whether a patient would follow your instructions. With the commonality of two-week overnight wear, any noncompliance on the part of the patient could lead to serious ocular complications at a time when medications to treat these problems were still under development. Lens materials and lens care solutions have also improved significantly in the last several decades, as have lens options.

The best thing that ever happened in the industry was the introduction of daily disposable lenses, as they have increased patient compliance with keeping lenses clean—and eyes healthy. The only downside is that daily disposable lenses cost more than their earlier counterparts. Still, the benefits outweigh the negatives.

FEBRUARY 1987

How to Fit Rigid Gas Permeable Extended Wear Lenses

By Joseph P. Shovlin, OD

As I look back on the last three decades and reflect upon contact lens technology and lens options in particular, I am amazed at just how successful we were back then. So, the question is, were we luckier than we deserved to be, or were we forced to pay particular attention to the things we really understood at the time?

Back then, topography/tomography systems did not exist, and neither did the modern point-of-care diagnostic technologies available today. Lens options and solutions were also significantly more limited; yet at the time, we fit both GP and hydrogel extended wear lenses with some impunity from the dreaded complications with which patients were adequately screened and educated upon.

Nowadays, things have been tempered a bit. Extended or continuous wear is rarely used as a viable lens option for new patients today, which may, in part, be due to additional concerns that we have learned over the years, though it could also be the result of expanded technologies like daily disposables and refractive surgery options. I hope that new advances and additional options will continue to bolster the profession.

MAY 1987

Glaucoma: How to Evaluate the Visual Field

By Murray Fingeret, OD

Wow, how time flies. Amazingly, the principles in the article (especially the steps in analyzing the field) are still applicable, though some things have changed since 1987. These changes include the introduction of Statpac Total & Pattern deviation maps, which revolutionized the analysis of single fields and was further refined with the arrival of the glaucoma hemifield test. Furthermore, glaucoma change probability analysis introduced the concept of event analysis for change, later strengthened by the arrival of the early manifest glaucoma criteria for interpreting it.


HOW TO FIT
RIGID GAS PERMEABLE
EXTENDED WEAR LENSES

Additionally, short wavelength automated perimetry came and went in popularity, while the concept of requiring a visual field defect to define someone as having glaucoma is also no longer pertinent in today's modern practice. Instead, the presence of optic nerve damage or retinal nerve fiber layer loss is now consistent with a diagnosis of glaucoma, even in the case of a full visual field. Lastly, the advent of HFA2


GLAUCOMA
HOW TO EVALUATE THE VISUAL FIELD

technology meant better patient ergonomics and gaze tracking.

Our attitude about the significance of detectable glaucoma change has also morphed radically. Before 1996, even the tiniest detected change demanded an escalation in therapy, no matter how radical. After 1996, thought leaders began basing therapeutic decisions on how fast change was happening, life expectancy and stage of the disease—not just the detection of any amount of change. It took another 10 years for this idea to permeate eye care, but it started in 1996. This new idea was introduced by Michael Patella, an optometrist who works at Carl Zeiss Meditec and was the developer of the HFA perimeter.

Very little has changed in the last 12 years, but a lot changed between 1987 and 2003, and more changes are on the horizon. Advances in the near future include tests to allow optometrists to examine the macula in more detail, tests that are expected to take half the time of the SITA Standard and the introduction of Size V testing, which will help reduce the variability and refractive error effects and also extend the test range.

MAY 1989

Sharpen Your Retinal Exam Skills

By Leo P. Semes, OD

A quarter century ago at the time of this article, optometry had embraced dilated fundus evaluation. The year 1989 also saw Kareem retire, Pete banned from baseball, Tiananmen Square shake the world, the Exxon Valdez run aground and *Time* select Gorbachev as *man* of the year (as opposed to person). Just a year prior, I, together with my colleagues, John Potter, Tony Cavallerano and Matt Garston, published our primer on performing binocular indirect ophthalmoscopy (BIO) and scleral indentation. At the time, autorefractors were primitive at best, online contact lens and spectacle sales were relatively unknown and eye examinations were performed live.

Contemporarily, the profession enjoyed nationwide dilation privileges. Fundus evaluation has largely evolved to survive along with BIO and posterior pole scrutiny with high dioptric-power plus lenses (+60, +78). These lenses offer enhanced stereopsis over a +90D. Yellow lenses have not been widely available, but with the current interest in phototoxicity, they may yet make a comeback. Pupillary dilation is now more convenient for both patient and clinician with the availability of Paremyd (0.25% tropicamide, 1.0% hydroxyamphetamine, Akorn). Though this formulation was available in 1989, it was not widely used and became dormant. However, now, I find that this formulation—available again—works very well for most patients, though it may be less effective in the elderly. It was conceived by an optometrist, the late Dr. Michael Larkin.

Also today, scleral indentation is taught routinely in optometry schools and is used widely by optometrists. BIO instruments have also become lighter and the light sources have evolved to LED, which offer better illumination and, consequently, improved resolution.

Interestingly, the patient discussed in the original article is now a practicing optometrist in Hayes, Va. Dr. Peter Wilcox states, "Today's technologies have moved many fundus structures and conditions from the clinically occult to the appreciable and hence, actionable, for the diagnosis, treatment and management of disease. For instance, the SD-OCT machines and certain angio-scanning devices (OCTA) allow for a sometimes-decades-earlier detection of posterior segment disorders. This allows patients to be counseled sooner to modify or initiate changes for more positive outcomes. The scanning laser ophthalmoscopy (SLO) technologies also allow for the never-dreamed-of-before-1989 analysis of ocular structures, and the upcoming shift in classic visual field analysis from gray tone printouts of visual field losses to the direct overlay (objective perimetry) of deficit to the deficient ocular structure or the pipeline of the neuro-ocular disease may also benefit practitioners."


SHARPEN YOUR RETINAL EXAM SKILLS

It's clear that OCT technology as well as certain other structural imaging devices now have penetration among optometrists comparable to what BIO had in 1989. Looking forward, we will likely see greater use of auxiliary evaluation strategies such as fundus autofluorescence, automated dark adaptometry, ultra-widefield fundus imaging as well refinements in the hardware and

software for OCT. These devices not only augment our clinical observations but also help us better understand ocular and systemic disease. We've come a long way in retinal examination in a generation.

SEPTEMBER 1989

Is Optometry Ready for Laser Surgery?

By J. James Thimons, OD

Atomic physicist Dr. Niels Bohr once said, "It is exceedingly difficult to make predictions, especially about the future." This article on laser surgery published in *Review of Optometry* 25 years ago makes reasonable truth of his off-handed observation on quantum physics. As it turns out, the nature of our profession and its progression during the last few decades has been just as difficult to predict.

Who would have thought over 25 years ago that optometrists today would have glaucoma privileges granted in nearly all 50 states (Massachusetts being the lone holdout), and that we would also be accepted as clinical partners in various national healthcare systems, Veterans Administration Medical Centers and large HMOs, both regional and national? The advent of laser surgery proved itself to be akin to Dickens' *A Tale of Two Cities*, as the industry burgeoned mightily and almost succeeded in manifesting the predictions of some of my good friends and colleagues, who viewed it as the start of our profession's demise. Instead, while still present, laser surgery is now a notably declined market, with no achievement of our long-term fears of world dominance.

"Within 10 years, lasers will be an integral part of patient management. It's almost impossible for optometry not to be involved," I wrote back then. I was prescient enough to contextually discern this prediction at the time, but not appropriately define. For more than a decade, Northeastern College of Optometry has been training young, vibrant and talented individuals to provide laser vision correction for their patients at both the college and in their practices following graduation. This is a program that didn't seem possible to run back in 1989.

Furthermore, I don't think that any of us would have predicted the development of optometry outside the United States 25 years ago. Since then, however, it has been a delight to work together with provinces and states in both Canada and Australia, especially as they continued to advance their level of clinical practice. Most recently, I was honored to witness and participate in the nationwide, singular legislative enactment that provided authorization for optometrists to treat glaucoma in Australia. This remarkable accomplishment has remained relatively under-appreciated here in the States given the distance between the countries and somewhat remote connection that many of us have to that part of the world. However, it is one of the biggest accomplishments that we have had in our profession, in that we have begun the process of universalizing the profession that we all love so very much.

As we did at the onset of laser technology, I believe it is our responsibility to continue adapting to and capitalizing upon other new innovations still in the works, from optical systems to disruptive technologies involving online access and diagnostic and therapeutic regimens, both medical and machine. In many instances, they are either at the margin of or beyond the current reach of our legislative scope—but this should only invigorate us to work more diligently to achieve better coverage, keeping in mind that they will be to the future what laser vision correction has been to us so far.

It has been a wonderful opportunity to share over 25 years with *Review of Optometry* as a colleague, contributor, reader and fan. I hope for the magazine and for all of us that the next 25 years will be as exciting and as fruitful as the last have been, and that the future will also continue to hold both the enjoyment and also the mystery of Dr. Bohr's insightful perspective.

SEPTEMBER 1989

An Inside Look at the New 'Secret' Agents


DRUG UPDATE

An Inside Look at the New, 'Secret' Agents

Here are hard-to-get details about the latest ophthalmic drugs

By Christopher J. Cakanac, OD

I wish I still had the hair I did when I wrote this article in 1989. Madonna was on the radio, and I was wearing skinny ties. At the same time, a pharmaceutical rep visiting an optometric office was such a rare occurrence that this article was primarily an attempt to get the message out about new drugs. Though many of those drugs are now gone, this article did touch upon the infancy of two drug classes we still use extensively today: topical fluoroquinolones and nonsteroidal anti-inflammatory agents.

To appropriately treat corneal ulcers in the 1980s, practitioners required adequate access to fortified topical antibiotics, the standard of care of the era. They had to be custom compounded, usually in a hospital pharmacy, which, for the most part, prevented optometrists

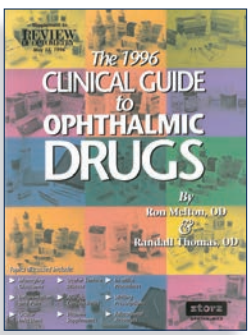
from using them routinely. Norfloxacin was the first commercially available fluoroquinolone; other drugs including Ciloxan, Vigamox, Zymaxid and Moxeza also eventually gave optometrists greater ease of treatment for corneal ulcers with readily available agents.

Another drug, Ocufen, was the first of a separate new class of medications known as nonsteroidal anti-inflammatory agents (or NSAIDs). Other more recent examples include Voltaren, Acular and Prolensa. Drugs with anti-inflammatory activity that didn't have the side effects of steroids were unheard of at the time. Ocufen was the first NSAID introduced, and its indication was to prevent miosis during cataract surgery, though we quickly learned it prevented cystoid macular edema, which is still one of the primary indications for NSAID use today. We also discovered these medications prevented pain from corneal abrasions, thus eliminating the dreaded pressure patch.

MAY 1996

The Clinical Guide to Ophthalmic Drugs

By Ronald N. Melton, OD, and Randall K. Thomas, OD



When we started optometry school back in the fall of 1977, North Carolina had become only the second state to authorize legislation for the prescribing of therapeutic drugs by optometrists. We were keenly aware of this new high bar that was set for our profession, and for the next four years that we attended the Pennsylvania College of Optometry, we dedicated ourselves to learning all we could about therapeutic eye care. During that time, it became clear to us that there was a gap in pharmaceutical/therapeutic education in the post-doctoral optometric population. As such, we felt the need to develop some kind of a concise, clinically practical guide to help speed the acquisition of knowledge in the field of ocular therapeutics. This effort began about 20 years ago, when we sat down to put together the first drug guide.

Over the years, many medications have come to market beyond what was initially offered to the first optometrists to gain TPA rights and, beyond that, there has also been an expansion in the use of currently available drugs. Our purpose with the drug guide was not only to educate our colleagues about new drugs but also to enhance our colleagues' therapeutic application of those drugs that were currently available at the time. More than anything, we wanted to instill greater confidence in our colleagues to embrace this vital aspect of optometric practice.

It is in this spirit that we continue to edit the publication on an annual basis, now in its 20th year. Our work with the drug guide has, in a large part, been motivated by a great many of our colleagues who have encouraged us to continue in our efforts. We sincerely wish there were even more new drugs and applications to discuss annually. Fortunately, the professional literature continues to provide us with additional information to share. It is our hope that the drug guide will continue to be a help to those in our profession who strive to achieve a greater level of excellence in patient care. ■

ONE BILLION CHAIRSIDES LATER...

This column has been marking its territory in these hallowed pages for a quarter of a century. So watch where you step.

BY MONTGOMERY VICKERS, OD

When I heard *Review of Optometry* was dedicating an issue to how old it is, I wondered: Why would anyone ever want to dedicate anything to how *old* they are? After further inquiry, I found out they even wanted me to participate, since I was at least the second longest-running writer for the magazine. I must be pretty old.

This graphic from a 1934 issue predates Dr. Vickers—barely.

(For the record, Dr. Joe Shovlin has been editing the contact lens stuff for longer than I've been here, which means online contact lens sales started under his watch. Way to go, Joe.)

IN THE BEGINNING, THERE WAS ME

So, somewhere around 125 years ago (seems like) I started writing this *Chairside* column. At that time, as I recall, the profession of optometry was just emerging from the primordial muck, sprouting small prehensile tails and various vestigial organ systems, such as retinoscopes. You can Google those.

I had thoughtfully planned my full frontal assault on the stone tablets they once called *Chilton's Review of Optometry* because I had realized that, if nothing changed, we were all doomed—DOOMED, I SAY!—to read only boring physiological optics formulae that, after three hours of pencil to paper, would help us prescribe +2.50 Kryptok bifocals for 57-year-olds. Nothing personal, Dr. Donder, but your table is a yawner.

Against all odds, and thanks to the benevolence of industry giants like *Review*'s legendary publisher Mr. Rick Bay, I persevered and eventually added some critically important optometric concepts to the academic literature, such as "I used to dress up like Thor, God of Thunder" and the seminal word "narwhal," which had never before, and has never since, been part of a medical magazine, unless you count that unusual surgical case I saw in *The Colon Observer* back in '94.

Please allow me to take a moment to thank the amazing late Mr. Bay, all of my editors (many suffering with PTSD) and you, my readers. I like to think it has given us a chance to take time each month to put aside our many responsibilities so we can concentrate on what really matters: Dr. Montgomery Vickers' multitude of neuroses. As one reader put it, "*Chairside* is a breath of fresh air, except when it stinks."

OK, I wrote that, but I knew what you were thinking.

Chairside has afforded me some blessed moments, like when my then-young children witnessed a random colleague ask for my autograph in New York City on our way to Vision Expo. My son asked me if I was famous. I was embarrassed that, at age 10, he did not know that already. We immediately sent him to boarding school.

I once even met my idol, uber-humor columnist Dave Barry, and I will never forget the kind words he shared with me: "You splashed my shoes, man!" I knew just what he meant and have since tried to live my life accordingly.

I have also had the honor of hobnobbing with the finest minds in optometry such as Drs. Paul Ajamian, Paul Karpecki, Paul Kabat…What? His name is Al? Well, I don't actually know these people, so whatever.

A couple of times I got to lecture at THE Ohio State University College of Optometry to the soon-to-be-graduating fourth-year students. My understanding is that only a few quit to become dental techs.

I have spoken all around the world at optometry meetings. OK… all around Birmingham, Alabama, anyway. The audience was captivated in utter silence, absorbing every word. Unfortunately, I was doing optometric standup at the time.

Luckily, this photo was taken before I decided to get my first and only perm. I thought it would make me look as cool as New Kids On The Block. The bad news is it worked; I was officially as cool as New Kids On The Block. Yuck.

ACCORDING TO THE BOOK OF VICKERS

What a run! When *Review of Optometry* first rolled out in 1891, thanks to founding editor Frederick "The Bogerman" Boger, no one could know we would still be reading it. Looking back, I thought I should share some excerpts from my very favorite *Chairside* columns, but since none of those were ever published, I let the staff pick a few tidbits. So don't blame me.

On Chairside

Most of the optometric articles we read are written by someone on a different wavelength than we are … How about an optometric author who talks about how it feels to be out there dealing with optometry, as we Regular Joes and Joannes know it, on the front line? That's where I think I come in. I am, I believe, a "street" optometrist. I am, I believe, one of you. (*January 1991*)

On ODs' Inferiority Complex

Optometrists can have an inferiority complex. We sometimes feel disrespected by our ophthalmologist colleagues and by our legislators. We feel we have no power. This may be because our receptionists tell us to shut up when we start telling that same old story about some guy's glasses for the 100th time. (*October 2004*)

On No-Shows

As you may know, there is a direct relationship between weather and no-shows. If it's pretty outside, nobody can make it. If it's snowing a foot or two, one of my patients is standing hip deep outside my office because a screw came out of his glasses two weeks earlier. (*December 2004*)

Last week I had eight no-shows. EIGHT! My plan is to reschedule these fine patients just as soon as possible. I think we'll let them have any Friday appointment. By the way, we're not open on Fridays. (*September 2005*)

On Patient Loyalty

And then there's the loyal patient who wanted only me to check her eyes. But could I come and do it at another local doctor's office, because they accept her vision plan and I don't? (By the way, this call was made by the other doctor's receptionist!) (*March 2005*)

On Smoking and Eyesight

We all know about the health issues that smoking causes, even in the eyes. One lady, with tears in her eyes, spent 20 minutes describing the utter turmoil in her family due to her mother's macular degeneration and loss of vision. She begged me for information. "Quit smoking," I said. She said, "Can I get a second opinion?" (*April 2005*)

On the Origin of the Species

The first single-celled organisms developed a tiny little organelle that sensed light, and these rudimentary creatures began to move to the light—what we now call Florida. This is when the first State Board was created to keep all the other single-celled organisms from moving to Florida to practice. (*September 2004*)

On Family

I know. Your kids are wonderful. Well, not as wonderful as mine. Better luck next time! Yes, my kids are brilliant. They are physically and spiritually beautiful, and I often wonder who their father might be. (*January 2006*)

The next time a long-lost cousin comes up at the family barbecue and asks you about

Ten years in. I had finally mastered the obviously fake smile that all celebrities must have. You can tell I had been in practice for a while since I had lost my eye model's cornea.

his eyes, just smile and "remind him" that you're a dentist. And don't forget to tell him you moved your office to Canada. (*April 2015*)

On the Proper Equipment
When I was starting out in the late 70s, I could not afford an ophthalmoscope and retinoscope. At that time, my understanding was that these tools were actually needed if you were going to do an eye examination. Of course, this has since been shown to be totally false. (*August 2007*)

On Optometric Income
My plumber did 45 minutes of work and then handed me a bill for $376. I told him I was a doctor and I didn't make $376 for 45 minutes. He said, "When I was a doctor, neither did I." (*October 2012*)

On Ophthalmologists
They may have butlers to help them do it, but ophthalmologists put their pants on one leg at a time—just like optometrists. In fact, they're busy trying to become optometrists, learning contact lenses and optics at their meetings. (*September 1991*)

On Humility
Quit beating yourself up for the stupid thing you said yesterday. There will be a new stupid thing you say today to take its place. (*February 2008*)

On the Value of Eye Care
Always presume your best, most loyal contact lens patient will slit your throat to save a dollar a multipack. (*July 1998*)

If you go to the proctologist for a colonoscopy, you'll see a $49,000 car in his parking lot—and he'll be wearing a $3 pair of glasses as he analyzes your life as we know it. (*June 2004*)

Some patients will spend any amount of money on important stuff, like pet chickens. But something frivolous like eye care? Forget it. (*November 2005*)

On Optometry
Two of the 55 best things about being an optometrist: 12. The eye is definitely the second most awesome organ; and 22. Most people have eyes. (*July 1997*)

Headaches are just a part of your life, which can only be avoided if you just choose a profession where you never deal with any human beings. Or if you avoid their sensory organs at least, as patients can be quite demanding when you mess with those. (*May 2012*)

On Practice Management
I will buy every book on managed care that I can find. I always enjoy a good fire and marshmallows. (*April 2000*)

On Technology
There's this app that allows you to take a picture of someone and then bend it to make it look really weird. I use this to demonstrate astigmatism and also to show patients what they look like when they buy glasses at the mall. (*September 2010*)

To think this $500 paperweight (i.e., smartphone) can replace my need to refract? I have died and gone to heaven! Now the world won't come to an end because opticians won't have any reason to politick to refract. Heck, any idiot with an app can refract now, right? And, lazy ophthalmologists will finally stop using Donders' Table to decide what seg power a patient needs! The phone will decide! Sweet! (*July 2014*)

Quit pushing buttons and ask the patient exactly what they need to see. You can use your fancy doodads to figure stuff out, but at the end of the day, it comes down to whether they can read the hymnbook on Sunday. (*December 2015*)

Now you see the real me. This photo was taken with me in a Speedo at the bottom of the ocean. Nice job Photoshopping, eh?

As esteemed oral surgeon Brian Alpert, DDS, said, we are all "just two axons held together by a spirochete." I like to think *Chairside* is our shared bacteria. Thanks for reading. ■

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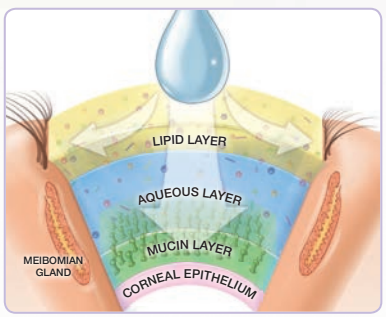

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