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SCOPE

Deborah Pavan-Langston, MD, FACS: Lighting a Path

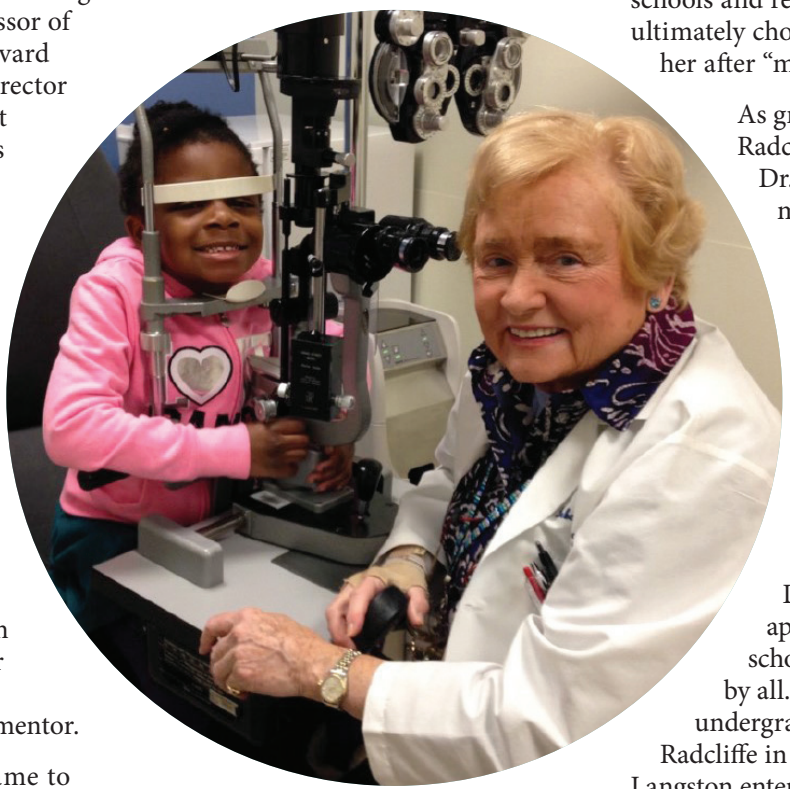
By Joan W. Miller, MD

I have had the pleasure of knowing Dr. Deborah Pavan-Langston since 1986, when I joined Massachusetts Eye and Ear as an ophthalmology resident.

At the time, Dr. Pavan-Langston was an associate professor of ophthalmology at Harvard Medical School and director of the cornea service at Brigham and Women's Hospital. Dr. Pavan-Langston supervised me as a second-year resident, and frankly, I was a bit intimidated by her accomplishments and expertise, even though she was extremely down-to-earth. Dr. Pavan-Langston was clearly an efficient and knowledgeable clinician who taught in a no-nonsense manner and was also a very generous teacher and mentor.

Over the years, I came to admire her brilliance, tenacious spirit and — most of all — humility. Dr. Pavan-Langston has made a profound impact as a clinician, researcher, and mentor over the last three decades and has served as an inspiration to women ophthalmologists as a true pathfinder.

Dr. Pavan-Langston's mother, Elmyra Reed Pavan, a lawyer, played a major role in her educational and professional trajectory towards medicine.



Dr. Pavan-Langston with her granddaughter Seneca.

In Dr. Pavan-Langston's senior year of high school, her mother "gently informed" her that she would be applying to Radcliffe and Massachusetts Institute of Technology (MIT). It was helpful, as Dr. Pavan-Langston has admitted to being rather "clueless" about college. To that end, Dr. Pavan-Langston recalls being "pretty sure" that her mother filled out the required college applications, as she remembers nothing about the grueling application process. Dr. Pavan-Langston was accepted to both schools and remembers her mother ultimately choosing Radcliffe for her after "much anguish."

As graduation from Radcliffe approached, Dr. Pavan-Langston's mother encouraged her to apply to medical school, which was not a popular path for women in those days. Against the advice of her academic Dean — who thought nursing was a more suitable career for a young woman — Dr. Pavan-Langston applied to four medical schools and was accepted by all. After earning her undergraduate degree from Radcliffe in 1961, Dr. Pavan-Langston entered Cornell University Medical College in New York City as one of only five women in her 105-member medical school class. In 1965, Dr. Pavan-Langston earned her MD degree, graduating Alpha Omega Alpha at the top of her class.

With aspirations to be a surgeon, Dr. Pavan-Langston applied to

eight surgical residency programs and was turned down by all. Once again, Dr. Pavan-Langston's mother stepped in and suggested she try ophthalmology — which combines surgery and medicine — a suggestion that benefited us all!

Dr. Pavan-Langston wrote to Massachusetts Eye and Ear Infirmary and was surprised when she received a letter back from Dr. David G. Cogan, chief of ophthalmology at Mass Eye and Ear and Chairman of the Department of Ophthalmology at Harvard Medical School, saying "We have never taken a woman." Absent a flat-out rejection, Dr. Pavan-Langston saw an opening in the response from Dr. Cogan and seized the opportunity to request an application.

To her amazement, she received an invitation to join the other applicants on residency interview day. Dr. Pavan-Langston postulates that Dr. Cogan might have been swayed by his mother's experience. Dr. Edith Ives Cogan trained in ophthalmology at Women's Medical College of Pennsylvania and was one of the first three women ophthalmologists to practice at Mass Eye and Ear (before Dr. Pavan-Langston).

Dr. Pavan-Langston in her laboratory at Mass Eye and Ear.

In 1966, after an exhausting day of multiple interviews, giving a one-hour seminar to the Howe Laboratory staff on viral disease and flying up and back from New York City, Dr. Pavan-Langston became the first woman accepted into the 130-plus year-old ophthalmology residency training program at Mass Eye and Ear/Harvard Medical School. Of note, all male residency applicants had only two interviews and gave no lectures.

Before Dr. Pavan-Langston could begin her clinical residency, she was required to complete a two-year National Institutes of Health research fellowship in ophthalmology — something that was not expected of her male resident colleagues. Dr. Pavan-Langston worked with Nobel Laureate, Dr. John F. Enders, conducting research in tissue culture (for which he was awarded the Nobel Prize) and virology before beginning her ophthalmology residency in 1968.

Dr. Miller (left), stands with Dr. Pavan-Langston and members of her family at her portrait unveiling ceremony at Mass Eye and Ear.

Toward the end of her residency training, Dr. Pavan-Langston gave a talk on Herpes Simplex of the eye, catching the attention of Dr. Claes Dohlman founding director of the cornea service at Mass Eye and Ear. In 1969, Dr. Pavan-Langston achieved yet another first when she became the first woman cornea fellow at Mass Eye and Ear as one of Dr. Dohlman's fellows.

Dr. Pavan-Langston's early career trajectory was a sign of great things to come. She joined the cornea service at Mass Eye and Ear and Harvard Medical School in 1971, also serving as the director of the virology-uveitis laboratory, first at Mass Eye and Ear and then at Schepens Eye Research Institute from 1968 to 2012.

A highly sought-after surgeon and expert in corneal disease, Dr. Pavan-Langston became the

Deborah Pavan-Langston, MD, FACS

first woman director of the Mass Eye and Ear cornea service, a role in which she served until 1977. From here, her career flourished, and Dr. Pavan-Langston moved quickly up the ranks as a clinician-scientist, teacher, and leader.

At the height of her clinical career, Dr. Pavan-Langston saw an average of 1,500 patients in the Mass Eye and Ear cornea service each year, all while managing multiple leadership and advisory roles, at regional and national levels. She chaired the Federal Drug Administration (FDA) Ophthalmic Drug Advisory Committee and also served on the President's Commission on Bioterrorism Preparedness and Response Committee at the Centers for Disease Control and Prevention (CDC).

When I became chair of Harvard Ophthalmology in 2003, I investigated why Dr. Pavan-Langston had not yet been promoted to professor, given her numerous accomplishments and profound contributions to ophthalmology and across the tripartite academic mission at Harvard Medical School. Thankfully, I was able to successfully shepherd her promotion, as Dr. Pavan-Langston achieved the rank of professor of ophthalmology at Harvard Medical School in 2009, a proper reflection of her extraordinary and accomplished career.

In addition to her impressive administrative resume, Dr. Pavan-Langston's pioneering work in ocular virology made her an internationally recognized authority on ocular herpetic diseases — the most common cause of corneal blindness in the developed world. Dr. Pavan-Langston's research in ocular virology has resulted in innovations that have greatly improved patient care and public health for Herpes Simplex and Herpes Zoster diseases.

Deborah Pavan-Langston, MD

Always a trailblazer, Dr. Pavan-Langston was among the first in her field to study the efficacy and toxicity profiles of antivirals in animal models and patients, as well as the first to report on treatment outcomes and diagnostic tests in patients with eye disease. She was also among the first to publish formal diagnostic categories for ocular herpes simplex samples based on specific etiology. The publication of these diagnostic categories aided in better treatment for this disease, and this system is still used internationally and continually refined by clinicians. She was also the first to introduce the significance of pain in herpes zoster ophthalmicus.

Dr. Pavan-Langston's landmark work helped pave the way for FDA-approval of three ocular antivirals — trifluridine, acyclovir, and vidarabine — all of which are used to treat patients with corneal herpetic disease. Her extensive published works, which include over 250 original research articles, chapters, and reports, have guided three generations of cornea specialists, and influenced countless other students, ophthalmologists, and researchers around the world.

Her single-authored textbook, "The Manual of Ocular Diagnosis and Therapy," is one of the most widely read ophthalmology texts in the world. Originally published in 1980, this text is now in its sixth edition and is published in seven languages. As a testament to this, Dr. Gena Heidary once commented that Dr. Pavan-Langston's "commitment to clinical excellence is inspirational. I still carry her sheet outlining the management of patients with herpetic eye disease with me every day in my work bag…a reminder of her teaching and influence upon us all." Dr. Pavan-Langston's educational efforts are lasting and far-reaching, as Dr. Dasa Gangadhar shared that "her fingerprint is on every herpetic patient to whom I render care."

A beloved teacher and generous mentor, Dr. Pavan-Langston not only made a tremendous impact on my career as a colleague and trusted friend, but she influenced generations of ophthalmologists and vision researchers, and was instrumental in training all of the fellows, residents, and medical students who came through the cornea service at Mass Eye and Ear. In fact, many of Dr. Pavan-Langston's former trainees credit her as the reason they chose their specialty!

Of the more than 50 trainees she directly mentored in her laboratory and clinics, more than half have pursued careers in academic medicine, with seven former trainees currently serving as department chairpersons for their academic institutions. When reflecting on their time under Dr. Pavan-Langston's tutelage, her former students fondly described Dr. Pavan-Langston as, "generous with her time," "enthusiastic about her work," "an inspirational force," and "a very positive person no matter the circumstance." Her teaching has been called a "lesson in humanism," and "one of the greatest gifts of my career." But, perhaps Dr. Andrea Cruzat, said it best when she described Dr. Pavan-Langston as "a living legend and leader to learn from for all the women in this world."

Throughout her career, Dr. Pavan-Langston's contributions

have been recognized with many significant honors and some of the highest awards given for her field and specialty. In particular, she is only one of two people, and the first woman, to receive three of the highest international cornea awards: the Castroviejo Medal for outstanding contributions to the field of corneal and anterior segment disease (1996), the Phillips Thygeson Plaque for outstanding research in corneal disease (2005); and the Claes Dohlman Society Award (2016).

In 2011, Dr. Pavan-Langston was honored at the 385th Harvard graduation and the 50th reunion of her Harvard class of 1961, when she was one of only three members to be inducted into Alpha Iota of Massachusetts, the Harvard College chapter of Phi Beta Kappa. This honor is one of Harvard's most prestigious and a very fitting testimony to Dr. Pavan-Langston's pioneering work as a clinician-scientist and educator.

Dr. Pavan-Langston (sort of) retired in 2015 at the pinnacle of her profession, 50 years after entering the field, but has continued to publish results of long-term, ongoing studies with her former fellows. In that same year, Dr. Pavan-Langston joined the Board of Trustees at Mass Eye and Ear, where she continues to contribute her passion and expertise to our mission. We were thrilled to unveil a portrait of Dr. Pavan-Langston outside Meltzer Auditorium at Mass Eye and Ear in the hall of "greats." Not only an accomplished surgeon, scientist, and teacher, Dr. Pavan-Langston is also devoted to her family — in particular, her daughter Wyndam Ayares, EdD, son-in-law Joshua Ayares, DArch, and granddaughters Nyah and Seneca.

The babysitting hours Dr. Pavan-Langston puts in with Nyah and Seneca is something she clearly relishes in her "retirement!" Her son Talcott is a Wall Street computer scientist in New York City, and her brother Dr. Peter Reed Pavan, (Retina) is another illustrious graduate of the ophthalmology residency training program at Mass Eye and Ear/ Harvard Medical School, and Chair Emeritus of Ophthalmology at the University of South Florida.

Dr. Pavan-Langston with a Mass Eye and Ear cornea service patient

Throughout her storied career and life, Dr. Pavan-Langston has influenced and inspired three generations of women to pursue their passions and goals in academic medicine and private practice. She has shown by example what it means to strive for excellence in one's life, and the value of perseverance, no matter how challenging the task.

Ever humble, Dr. Pavan-Langston would be the first to downplay her role as a pioneering woman surgeon, but those of us who have followed her know that our success is possible because of her courage and persistence and others like her. She has been profoundly inspirational to me, and to everyone around her — women and men! As a woman, clinician-scientist and trailblazing pathfinder, her contributions will continue to resonate for generations to come.

From the Editor's Desk

Reentry

By Alfredo A. Sadun, MD, PhD

As I write this, several weeks before publication date, I'm hard pressed to give the latest information about our COVID-19 pandemic. It keeps changing.

But I hope that we will be seeing some measure of a winding down of the COVID-19 crises, at least in the U.S. I want to now speak of reentry.

As of this writing, the death toll from COVID-19 in the US is more than 700,000. That's already 50% more than all the Americans who lost their lives in World War II. The economic and personal tolls this pandemic has taken are also horrific. Although the stock market and large companies seem to have largely recovered, there are millions of Americans who have lost or changed their livelihood.

Even ophthalmologists have been severely, though not evenly, impacted. About one-third surveyed say that their income has been significantly reduced because of COVID-19. This doesn't even consider how measures of caution and austerity have changed and reduced the pleasures of work. And then, there's the personal toll. We aren't going to meetings, traveling for pleasure, visiting our grandchildren or even, in many cases, dining indoors anymore. But, there is also evidence of some return to normalcy as we begin to consider ways that we can resume these daily acts that help characterize our lives.

Astronauts will tell you that after leaving the confines of earth and hurtling about in orbit at nearly 20,000 mph, they look forward to their return to home. But first, they must pass through reentry which is, by many accounts, the most grueling ordeal. The high velocity space craft must endure atmospheric drag and overheating which tests the structural integrity of the craft. There is severe shock layer turbulence on reentry. We should now consider what COVID-19 reentry might look like. It might not be so smooth.

Having survived the threat to our bodies, our pocketbooks and our lifestyles, we must now survive this reentry that carries its own set of challenges. First, let's understand that things will not return to where they were. Many things are gone forever and the new normal is going to be very different from the old normal. It will serve us well if we don't set our expectations too high. I always shook hands with my patients before and after I examined them and often added in a hug. Those days are gone and I know I will miss them.

My wife used to have me attend many social functions and parties where I would be seated alongside strangers. I confess a certain relief that those days may also be gone. And I've always hated long lines at events or shopping. So, I won't miss that now that most venues are sensitive to how this looks and will be more tuned to alleviating social congestion.

Other things will just be different, and maybe better. I've always been partial to outdoor dining and have the good fortune of living in Southern California, where we don't experience much in the way of inclement weather. Surviving restaurants have accommodated to COVID-19 with imaginative ways to provide cover in an outdoor patio and if my wife can get the seat by the heater, we're all happy. But, of course, many of my favorite restaurants have not survived. So, in short, things will not return to what they were, and we must be careful to see the glass half full.

We may not have much of a voice on how society adjusts to travel and recreation. But we will, in the aggregate, have some interesting choices to make as we vote with our feet. The process of adapting in the time of COVID-19 has given us lots of alternatives for the way things used to be and some of these things learned are useful.

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I have become facile with Zoom which I use three to four times every day. This includes my lab meetings that used to only involve seven or eight people, but now has expanded to double that size since several of my collaborators in Europe and South America can attend. We had to move it from late afternoon to earlier to accommodate the time zone changes as most of my collaborators live to my east. But we've also compromised some things that we used to have at my old lab meetings.

I miss the cake and ice cream when it was someone's birthday. The new meetings are an improvement in convenience but not as socially rewarding. When COVID-19 abates, will we go back to in-person lab meetings? At minimum, we'll have to offer our distant collaborators

a means of joining us by Zoom into what might be called a hybrid meeting. But while we'll see and hear them fine, they will have, on their tiny Zoom square, a picture of our entire conference room and not be able to see our individual faces. Or should we take along our laptops and Zoom in as individuals even as we gather together around one table? This might resemble the young people we see at restaurants whose attention is focused, not across the table at their dates, but at someone on their iPhones. So, we are now projecting the Zoom gathering on a large screen that used to be used for slides.

I won't even consider the controversial issue of virtual medicine in ophthalmology. I don't like it but some of my colleagues, and many patients, love it. What if patients demand it even after it is shown to lead to more medical errors? That subject deserves its own editorial.

Having things more convenient, or being more economical in time and money, is likely to be a huge lure that competes with what was the real thing. It's natural to have a tradeoff between expediency and high standards. How much are we willing to sacrifice? And will we descend to the lowest common denominator? If in-person lab meetings exclude some, wouldn't the majority go along with virtual meetings even if less satisfying? A hybrid lab meeting is a compromise that will fundamentally change the character of the whole.

This brings me to what will probably happen to professional meetings. I used to attend these at the rate of about one per month. This includes the Academy. Those who attended last year's virtual annual meeting, which was supposed to be in Las Vegas, may have missed out on personal get-togethers, alumni meetings, etc. But they probably loved the savings. Not having to close down our clinics for a few days, not having to fly across the country, not having to wait hours for a taxi from the airport, not having to pay for a hotel — there's a lot of time and money saved. After we compute this cost next year, will we all want to return to the old ways? And even if most of us say yes, what about the third who will view virtual as a good deal?

The likely option may be to offer a hybrid meeting and allow the membership to choose for themselves. I'm afraid of that, insofar as I'll be there in person but will miss many of those who only attend virtually. I suspect that my older colleagues in academia will be there. But maybe not as many of the newer members who are more adaptable to our brave new world and see the cost savings as substantial. And I fear that this may be a growing body.

I won't even consider the controversial issue of virtual medicine in ophthalmology. I don't like it but some of my colleagues, and many patients, love it.

As the meeting goes virtual, a larger percentage may find that convenience and savings trumps what the real-time experience offered. As the value of the meetings go down, the savings make more and more sense. It reminds me of the 1960s when steak aficionados bemoaned the arrival of McDonald's that offered great savings but at the cost of some steak houses. Maybe expanding the hamburger experience to everyone and often, was a legitimate tradeoff. I, for one, would advocate for many of the meetings going alternate years. We all go virtual one year and show up for the next. Naturally, there will be those that favor one over the other. But alternate years could preserve the steak experience for some years.

Finally, I think we should think hard about what some of these new tools and ways of doing things affects the world of education. I love giving lectures. I'm at my best when I give didactics or, even more so, teach Socratically. For a couple of months after COVID-19 arrived, I found myself completely stripped of medical students, residents, and fellows, so I called in the techs and the patient's family members for impromptu rounds.

But years before the pandemic, there were already calls from the education community citing studies that our old-fashioned way of teaching was good for us, the professors, but not so good for millennials. Studies showed that the flipped classroom worked better. Students learned better when they heard the lecture online, at home and at their convenience. Classroom time was better spent going over the details and problematic issues. Learn at home, study in the classroom — flipping the old script. We are doing this now with our residents at UCLA and, I expect, across the country.

Every challenge brings new opportunity as well. Foreign students who could not afford to travel and study at the Ivy Leagues are now getting Ivy League online education from their dining room tables around the world. And we may find out that our universe of educational and social opportunities has never been bigger. Grand Rounds at UCLA now has more than twice the audience of pre-COVID-19 days. Retirement, or partial retirement, now will include options that allows us to remain not only involved, but truly engaged in intellectually stimulating opportunities. So, let's buckle our seatbelts, absorb the turbulence, and show some pluck as we reenter.

Slava Fyodorov, MD: How Russia Influenced Refractive Surgery in the U.S.

By Stephen A. Obstbaum, MD

For a long time, I thought about writing an article on Russian ophthalmologist, Svyatoslav "Slava" Nilokayevich Fyodorov, MD but was uncertain how to approach a topic about the early days of refractive surgery.

Should it be a tribute to Dr. Fyodorov, who reinvigorated radial keratotomy from the earlier work by Sato? Should I report on my initial exposure to radial keratotomy in Moscow? Should it be about the formation of the Prospective Evaluation of Radial Keratotomy (PERK) study? Or should I include all of that?

Today, the impetus for me to sit down and finally tackle this project is the recent American withdrawal from Afghanistan.

I arrived in Moscow on Jan. 24, 1980. I had been personally invited by Dr. Fyodorov and more formally through an invitation by the Ministry of Health. Four days earlier, then President Jimmy Carter proposed that the summer Olympics be moved from Moscow if the Soviet Union did not remove its troops from Afghanistan.

Two months later, on March 21, President Carter pulled the United States Olympic Team from the Moscow Olympics in a boycott, along with 64 other nations. Forty-one years later, although in a different context, Afghanistan's domestic problems are still being played out on the world stage.

Dr. Fyodorov was a visiting professor in New York during my residency and was active in teaching IOL implantation of the Sputnik lens after intracapsular cataract extraction. Many of us had the opportunity to spend time with him and learn his implantation technique. In subsequent years he was a frequent visitor to New York where several equestrian shops became his usual haunts. It was during one of these visits that he suggested I visit with him to learn the radial keratotomy procedure and to examine post-radial keratotomy patients, both recent and long-standing. By that time several thousand patients already had radial keratotomy performed in Moscow.

Svyatoslav "Slava" Nikolayevich Fyodorov, MD

Radial keratotomy had been introduced into the United States by Dr. Leo Bores, who had spent time in Moscow with Dr. Fyodorov. Several other U.S. ophthalmologists were also engaged in either learning about or already performing radial keratotomy. Fyodorov was interested in developing a surgical procedure to treat myopia and modified an earlier Japanese technique that created incisions into both the epithelial and endothelial corneal layers. Professor Tsutomu Sato working at the Research Institute of Ophthalmology of the Juntendo University School of Medicine did this surgery in animal models and then performed human clinical studies. In his 1953 *American Journal of Ophthalmology* publication, he stated, "This new surgical approach to myopia (anterior and posterior half-corneal incisions) is a proven, safe method which definitely cures or adequately alleviates over 95% of all cases of myopia in Japan." As we learned later, virtually all these eyes developed corneal decompensation because of endothelial damage. Dr. Fyodorov was undaunted by this prior unfavorable experience. He believed that there was a surgical solution for myopia.

Although his major emphasis was on a corneal approach to the condition, members of his department and others in Russia were also investigating methods to strengthen the posterior sclera in cases of high myopia. Dr. Fyodorov's approach used anterior incisions into the "peripheral circular ligament of the cornea" to reshape the cornea. These incisions would produce peripheral corneal bulging and central corneal flattening to reduce the myopic refractive error. Many ophthalmologists were skeptical of his reported results. I firmly believe that Dr. Fyodorov's persistence, dynamism and positive drive were responsible for the ultimate acceptance of radial keratotomy.

My two week stay in Moscow was professionally, culturally and socially enlightening. From the moment I was met at Sheremetyev Airport, where Dr. Fyodorov plopped a fur hat on my head while

telling me that one loses 40% of body heat through the scalp, until my last morning in Moscow having breakfast in his apartment, I was awed by the complexity of this man. I learned that a ranking member of the Communist Party lived a completely different life than the citizen who waited in line for hours to buy food and clothing.

Dr. Fyodorov used my visit to permit key members of his staff to invite me into their homes for dinner. They did not have to wait in line for food or beverages since they were entertaining a person invited by the Ministry of Health. I watched him bolster the confidence of one of his students, who was defending his doctoral thesis. This young man was being badgered by a professor, who was not favorably disposed to Dr. Fyodorov and his rise in the international ophthalmic community. As it was ultimately explained to me, Dr. Fyodorov told the professor that he should only be critical of a student's work and not the institution where it was performed. He did not accept the ad hominem nature of this criticism.

A large shipment of equipment was delivered to the new eye institute Dr. Fyodorov was building. When I was there only two of the three buildings were functional. As an instrument shipment from Zeiss Jena was being unloaded from one truck, the crates and their insulating materials were being loaded onto another truck. I paid no attention to this at the time since I was so impressed with the quality and quantity of the instruments and questioned to myself who was paying for all this equipment.

Several days later, I was invited to Dr. Fyodorov's dacha (a country home). Adjoining this area, filled with small weekend retreats for the Soviet elite, was a peasant village and small farm. It was here that Dr. Fyodorov kept his horses. As we walked into the barn, I was amazed to see Zeiss Jena crating and insulating materials filling many of the openings and crevices in the walls of the barn near his beloved horses. He was never one to permit the waste of resources, no matter how trivial, in a social environment where even small things were precious.

Dr. Fyodorov was a fair yet demanding boss. The people working for him were equally dedicated to creating a world-class eye institute. Dr. Valery Durnev was one of the young ophthalmologists who did the major work on astigmatic keratotomy. He reviewed most of the long-term patients with me as I examined them. He related how the radial keratotomy procedure had evolved from earlier techniques using only peripheral incisions that did not have a lasting effect, to those that were now being used that considered the depth and length of the incisions. My lasting memory of him was sharing cognac and chocolates and speaking about inviting him to visit the U.S. Sadly, his young life ended in a tragic accident a year later.

I was met at Sheremetyev Airport, where Dr. Fyodorov plopped a fur hat on my head while telling me that one loses 40% of body heat through the scalp.

So, I returned to New York excited about the prospect of performing radial keratotomy surgery if I could get it approved by Mount Sinai Hospital. Then a strange thing happened. I received a call from Dr. George Waring, who I had known only casually from scientific meetings and in his role as an editor on *Survey of Ophthalmology*. He had learned that I had visited Dr. Fyodorov and wanted to hear about my experience. He also asked if I could reach out to Dr. Fyodorov to extend him an invitation. I told him I would contact Dr. Fyodorov but that I could not guarantee success. I also suggested that he might consider visiting Dr. Fyodorov on his own, since several American ophthalmologists appeared in his clinic, uninvited, while I was there. Dr. Waring did visit Dr. Fyodorov by invitation.

Then in March, I received an invitation from Dr. Waring to attend a meeting at Hartsfield International Airport in Atlanta. The purpose of the meeting was to explore the prospect for a research study of radial keratotomy. It was attended by ophthalmic surgeons and members of the National Eye Institute. This was the impetus for the PERK study that was later designed to evaluate the safety and efficacy of this surgical procedure.

There were several reasons for studying radial keratotomy at that time that I presented at a Keratorefractive Society Meeting on *Controversial Aspects of Radial Keratotomy* in 1980. First, the procedure that Dr. Fyodorov had already made technical modifications from his initial procedure. Second, some of surgeons already performing radial keratotomy in the U.S. had further modified Dr. Fyodorov's technique.

Third, we wanted a better understanding of how incising the cornea reduced myopia — how the number, length and depth of incisions influenced the effect. Fourth, we wanted to learn why some myopic eyes fared better than others. Finally, we wanted to learn all the variables that could be influenced to make the procedure predictable. A large body of data reflecting a singular surgical approach was lacking and the PERK study sought to fill this gap.

PERK also afforded me the opportunity to serve as a spokesperson to promote the study and to be interviewed by journalist Diane Sawyer and newscaster Earl Ubell (who also observed surgery) on local New York TV stations and on the nationally broadcast *Phil Donahue Show.* The Atlanta meeting also had an unintended consequence. Many of those who attended that meeting were ultimately sued for restraint of trade.

But that's a story for another time.

On Pandemics: Looking Back from COVID-19

By Steven Newman, MD

Editor's note - I asked an old friend and colleague, Steven Newman, MD to put our present COVID-19 pandemic into context. Dr. Newman, a neuro-ophthalmologist, is an extraordinary erudite man who puts most things into historical context. I knew of his passion and ability to teach. His manuscript was comprehensive and filled with tantalizing facts. This, then, is the first of a four-part series that looks at COVID-19 within the context of other pandemics. These are the topics:

- *Etiology of Pandemics*
- *Historical Considerations of Pandemics (Chronology)*
- *Influenzas (especially Spanish Flu of 1918)*
- *COVID-19*

PART 1. ETIOLOGY OF PANDEMICS

A pandemic is an epidemic of an infectious disease that has spread across a large region affecting a substantial number of people. Although our current problems are with COVID-19, there have been other viruses and bacteria such as tuberculosis and the Yersinia Plague (Black Death) which have also caused global pandemics. Although some of the earliest cases of COVID-19 had ophthalmic (conjunctivitis) and neuro-ophthalmic manifestations, in other pandemics ophthalmic findings have been less common.

The earliest recorded pandemics go back to ancient Greece, but the earliest record of an infectious disease (which had ophthalmic findings) was found in Australia and was probably trachoma. Egyptian mummies showed evidence of trachoma infection one to two centuries before the common era. These epidemics not only reduced the population but had major economic, cultural, and military consequences. Probably the earliest well recorded pandemic was in 6th century B.C. involved the Peloponnesian wars (between two Greek factions lead by Athens and Sparta). During the fighting most deaths (more than one-fourth of Athens' population) were due to an epidemic, leading to the subjugation of Athens and, a couple of centuries later, the rise of Rome. More recent studies have suggested this was typhus based on the examination of corpses.

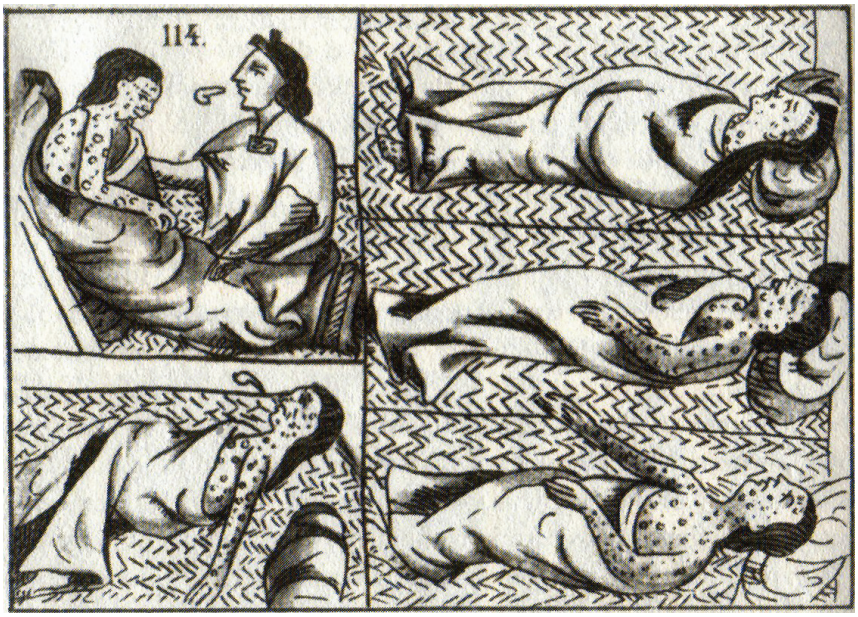
We can look at pandemics in four ways: 1) etiology 2) chronologically 3) death rate (which may be total number of deaths or a percentage of the population) or 4) The extent of disruption caused by the pandemic (either monetarily or with social disruption). This section is organized by etiology which was largely not understood at that time.

Documented outbreaks of previous pandemics go back to the plague of Athens, 430 to 426 B.C., during the Peloponnesian war which killed a quarter of the Athenian troops and a quarter of the population. It was so effective at killing people that it probably reduced its spread. Researchers at the University of Athens in 2006 analyzed teeth recovered from a mass grave and confirmed the presence of bacterium responsible for typhus. The plague of Athens included redness and inflammation of the eyes with possible blindness as can happen with epidemic typhus.

The Antonine plague between 165 and 180 A.D., could have been measles or smallpox (or even bubonic plague). It probably killed a quarter of those infected, or about 5 million people. The Antonine plague arrived in Rome from the east and ultimately involved approximately 15% of the entire empire. Galen described this as a black exanthem with fever and slight cough which may well have been early occurrence of smallpox. A second occurrence of this type of epidemic was the plague of Cyprian (also known as the plague of Commodus) in 251 to 266 A.D.

BUBONIC PLAGUE

Between 541 and 750 A.D., there was the earliest recorded outbreak of bubonic plague which started in Egypt and reached Constantinople, killing 10,000 people a day at its height and ultimately killing about 40% of the inhabitants of Constantinople. This was a fore-



16th Century Aztec drawing of smallpox victims. Image courtesy of Wikipedia.

shadowing of the great pandemic of Black Death (another name for bubonic plague) to come. This was later recognized to be due to the bacterium Pasteurella pestis.

The Black Death killed an estimated 75 million to 200 million people in the 14th-century and may have caused the most fatalities of any pandemic and certainly involved the highest percentage of the population. It is hard to deny that this pandemic had the greatest repercussions on civilization, religion, politics, and social organization. It may have been spread to Europe by one of the earliest uses of biological warfare during the siege of Kaffa (in the Crimea). Mongols catapulted corpses of Mongol warriors who had died of the plague into the city. From there it spread to nearby Constantinople and by ships to Genoa and Venice (via Messina), Italy in 1347.

Over the next few years, the Black Death killed an estimated 20% to 30% of Europe's population. This disease would recur in England every two to five years from 1361 to 1480. The Black Death could have three forms, bubonic, pneumonic, systemic. Ocular manifestations were not common, but could include bilateral panophthalmitis, as well as infiltration of the choroid and retina with neutrophils, necrotizing vasculitis, and retinal detachment.

The last time this was a major epidemic was in England between 1665-1666 which killed approximately 100,000 or about 20% of London's population. Between 1720 and 1723 the French port city of Marseille also suffered several rounds from bubonic plague. Daviel volunteered as a physician there before his development of cataract extraction and was thus honored by the king. A third incidence of Bubonic Plague occurred in 1855, starting in China and spreading to India where 10 million people died. It also involved the Western part of the United States.

CHOLERA

Cholera is spread by fecal contamination as recognized by Dr. John Snow, an OB/GYN who noted the victims all worked or lived near the Broad Street Pump. This observation led to an intervention. The handle was removed from the pump and an upgrading of the sewer system was instituted leading to a dramatic reduction in contamination. But more recently, viruses have been the major cause of pandemics.

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A third etiology are obligate organisms that are phylogenetically somewhere in between bacteria and viruses. These include rickettsia, including that responsible for typhus ("camp fever"). Although other rickettsial diseases may cause epidemics, they usually do not spread widely enough to be responsible for pandemics.

The World Health Organization (WHO) has a six-stage classification system describing how the disease begins, usually when animals are infected with a virus, and followed sometimes when animals with a virus infect people with a mutation:

Phase 1) animal to animal

Phase 2) animal to human

Phase 3) sporadic and cluster cases in human

Phase 4) sustained community level outbreaks

Phase 5) sustained in two countries

Phase 6) sustained in country and other WHO regions

Although parasites can cause epidemics they do not spread widely enough to be recognized as a cause of pandemics. These include malaria, which was particularly a problem during the American Civil War.

Viral epidemics are probably the leading cause of systemic human infection worldwide as recognized at the Rockefeller Institute. Viruses are compact vessels containing coded instructions in the form of either DNA or RNA. This distinction is important since while DNA based viruses may repair defects in their DNA, this is not possible in RNA based viruses. Hence, there is a much higher rate of mutation and potential clinical change seen in RNA viruses. RNA viruses include flaviviruses (yellow fever, dengue, Zika, West Nile) but while extremely infectious with a high mortality, they are usually too localized to be produce a pandemic.

YELLOW FEVER

Even before the better-known experimental work by Dr. Walter Reed, Army Institute of Research, Dr. Carlos Finley, a Cuban epidemiologist (who trained in France and Jefferson Medical College in Philadelphia), first theorized that mosquitos were the vector in yellow fever.

Yellow fever is still endemic in sub-Sahara Africa and tropical South America. This may produce choroidal thickening, vitreous cells, and yellowish sub-retinal lesions. Although perhaps not extensive enough to be called a pandemic it was one of the major reasons for the failure of the French to build the Panama Canal. William Gorgas had been sent to Cuba to study yellow fever and then was sent to Pan-

ama when the United States took over the building of the Canal. He was largely responsible for aggressive efforts to control mosquitos.

Yellow fever epidemics involved the Mississippi River Valley (in 1878, leading to a statement to Congress that yellow fever should be dealt with as an enemy which imperils life and cripple's commerce and industry) and also Philadelphia. Yellow fever caused several devastating epidemics particularly involving the U.S., occurring in New York, Philadelphia, and Boston, with an episode in 1793, killing as many as 5,000 people in Philadelphia which was roughly 10% of the population at that time. Yellow fever was also present during the Spanish American War.

MEASLES

A measles-like syndrome was initially described in Persia 854 to 925. Major outbreaks of measles-like syndrome occurred in the Pacific in 1875, killing one-third of the population. The incubation period was 10-12 days followed by cough, conjunctivitis, coryza, and fever. The most common ophthalmic complications included keratitis, non-purulent conjunctivitis, and rarely attenuated arterioles, retinal edema, neuroretinitis and retinal hemorrhages. This may result in pigmentary retinopathy with bone spicule or salt and pepper configuration usually when acquired in utero.

A late subsequent development related to measles can be sub-acute sclerosing panencephalitis, which produces focal and necrotizing retinitis and choroiditis, retinal folds, hemorrhage, serous detachments, and occlusive central nervous system vasculitis. The world's worst known epidemic of measles occurred in January 2020 in the Democratic Republic of the Congo but did not spread sufficiently to rate as a pandemic.

A child showing a day-four measles rash. Image Courtesy of Wikipedia.

HIV

Other previous epidemics include human immunodeficiency virus (HIV), which is no longer uncontrolled, outside of Africa. HIV probably originated in monkeys in Africa around 1920 (although not causing human disease until the 1950's). It was likely spread to the U.S. via Haiti. It is still a pandemic in Africa, with infection rates as high as 25% in some regions. Proactive education about safer sexual practices and blood born infection have markedly flattened the curve. Impairment of the immune system causes a tremendous susceptibility to secondary infections including pneumocystis and also neoplastic diseases including Kaposi's sarcoma.

Overall, HIV may have infected 75 million people and caused 32 million deaths. With the advent of HARRT (Highly active antiretroviral therapy), fatalities have become much less common. HIV causes ophthalmic microvasculopathy and frequently secondary bacterial and viral infectious disease. HIV patients also may have a high incidence of side effects of medications such as Ethambutol and Cidofovir.

ZIKA

Zika virus has been endemic in Africa and Asia for more than 60 years, probably transmitted by mosquitos producing a macular-papular rash, arthralgias, but also ophthalmic manifestations of uveitis, acute maculopathy, and non-purulent conjunctivitis. Other findings include macular scaring, focal pigmentation, iris coloboma, lens subluxation, cataracts, glaucoma, and micro-ophthalmia. Ocular coherence tomography (OCT) of infants may demonstrate outer retina pathology and hyperreflectility of the retinal pigment epithelium. Although this may produce significant morbidity there is no evidence that it has risen to the level of pandemic. Zika vaccines are the subject of investigation. Other findings include macula scaring, focal pigmentation,

iris coloboma, lens subluxation, cataracts, glaucoma, and micro-ophthalmia. OCT taken in infants may demonstrate outer retina pathology and hyperreflectility of the retinal pigment epithelium.

SMALLPOX

Smallpox (a DNA virus) was largely responsible for eliminating 80-90% of the indigenous populations of the Americas. Smallpox epidemics in the 16th century probably killed 56 million people in the Americas. It devastated the Australian aboriginal population, killing up to 50% of those infected. It also killed many of the native New Zealand Maori. Interestingly, it had been recognized in the middle of the second millennium in Africa and the Middle East (possibly first recognized in China around the year 1000) that patients that had previous episode of smallpox could not be re-infected. The mechanism behind this protection from previous infection was not understood but the concept probably was key to H.G. Wells' *War of the Worlds*.

Smallpox produced multiple pandemics throughout the world. It was during one epidemic in Boston (1721) that a therapeutic approach was investigated. Smallpox has always been a recurring epidemic, both in Africa and the Middle East. Protection from previous infection was understood in China, Africa and the Middle East. This was introduced to the colonies during the smallpox epidemic in Boston in 1721 when Cotton Mather, who played a role in the Salem witch trials, emphasized the use of variolization where smallpox scabs were applied to healthy individuals with the idea that if they got a mild-form of the infection then they would then be protected in the future, although there was really no understanding of the pathophysiology. He may have been influenced by the wife of the British ambassador to the Ottoman Empire (Lady Mary Wortley Montagu) where variolization was routinely practiced. Abigail Adams, (married to our second president, John Adams), probably saved hers and many other children in the Boston area by promoting this variolization process.

By the end of the 18th century (1796), Jenner noticed that milkmaids that developed cowpox were also protected from infection from smallpox. This was the beginning of vaccination to decrease the chance of a more severe episode of smallpox associated with variolization. George Washington supported vaccination for his troops and Thomas Jefferson as president (and having consulted with Abigail Adams for this) also strongly supported vaccination. Dr. Jean de Carro helped introduce vaccination to India and worked to discourage variolization. Vaccination for smallpox became mandatory in England in 1853. This did not save some Confederate soldiers who died of smallpox following the Battle of Antietam (U.S. Civil War).

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Interestingly there is evidence that smallpox may have affected Egyptian mummies from the 18th Egyptian Dynasty (1570 to 1850 B.C.), although the first clinical report was from 1350 B.C. during the Egyptian-Hittite War. There were ophthalmic complications, potentially producing blindness. Initial symptoms after an incubation period of two weeks included fever, malaise, and headache with progressive exanthem, first flat macular lesions then raised pustules vesicles with a mortality rate of about 30%.

About 2% to 3% of the infections would develop the hemorrhage form, which was nearly always fatal. About 5% to 9% of patients with smallpox developed ocular complications including involvement of the eyelids and possible corneal involvement. This could lead to corneal ulceration, hypopyon, iris prolapse, perforation, and endophthalmitis. Patients that survived could have disciform keratitis, iritis, iridocyclitis, and possible proptosis.

EBOLA

By 1911, Peyton Rous realized that viruses could also cause cancer, for which he would eventually win the Nobel Prize in 1966. More recently, potential epidemics include other extremely virulent viral diseases such as Ebola, Lassa fever, Rift Valley fever and Marburg virus. These have not extended as widely as some of the other diseases we have previously discussed thus not technically pandemic. Dengue fever was also caused by an RNA virus.

Ebola is a viral hemorrhagic fever first identified in 1976 with an epidemic in West Africa in 2013 and 2016 with an average fatality rate of greater than 50%. These patients tend to develop conjunctival injection, sub conjunctival hemorrhage, and vision loss of unknown etiology. Those that survive may develop post Ebola virus syndrome. Ocular complications include posterior, anterior and panuveitis as well as optic neuropathy and motility disturbance. Because this disease is so efficient in killing off its host, it does not seem to be capable of producing a pandemic.

Days of the Giants: W. Morton Grant, MD, at the Massachusetts Eye and Ear Infirmary

By Joel S. Schuman, MD

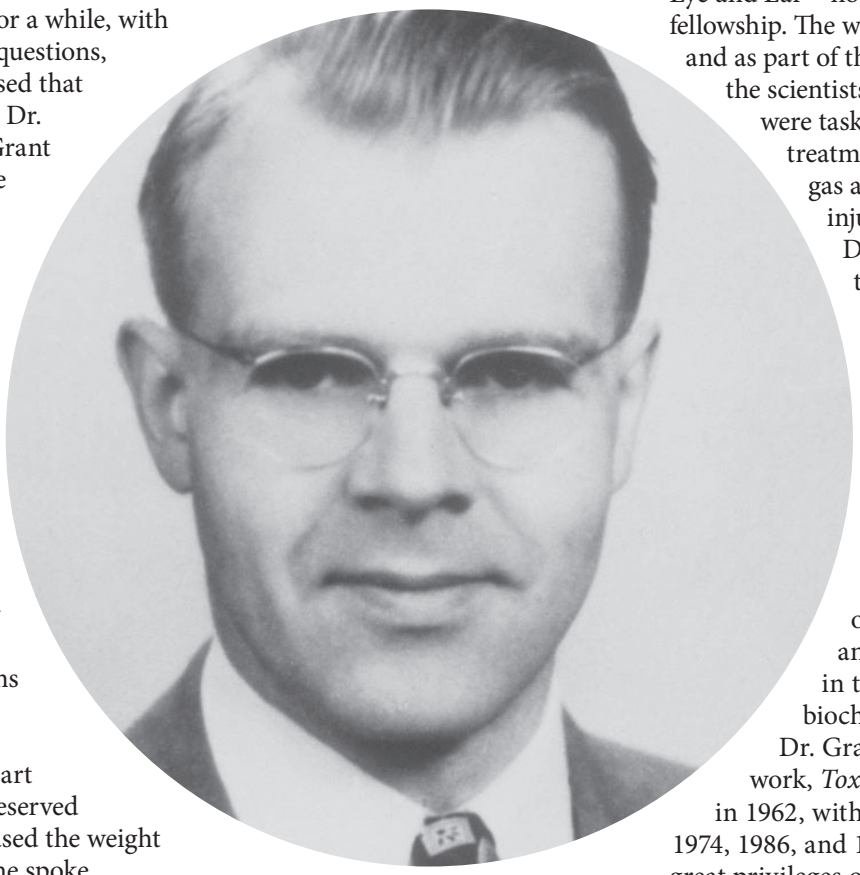
I first met Dr. W. Morton Grant in 1988 during the initial weeks of my glaucoma fellowship at Massachusetts Eye and Ear Infirmary.

I was attending the weekly glaucoma research meeting, and Dr. Grant was sitting at one end of a long table, arms crossed, listening calmly to the group discussion lead by David L. Epstein, MD. The presenter went on for a while, with Dr. Epstein asking questions, and a point was raised that left the room silent. Dr. Epstein asked Dr. Grant to comment, and he responded with a question that brought the issue into clear focus.

I learned that this was typical for Dr. Grant — he would sit quietly and softly ask a question when directly asked to comment, and only seldom otherwise. Dr. Grant's questions sounded simple yet were insightful and always led to the heart of the matter. His reserved manner only increased the weight of his words when he spoke.

Dr. Grant told me a story about a problem the astronauts were having in the early days of the United States space program. Shortly after reaching space, the astronauts would develop blurred vision, conjunctival hyperemia and tearing. NASA gathered experts, including Dr. Grant, and the group was having great trouble identifying the cause of this problem. Finally, Dr. Grant's thoughts were solicited, and as was his wont, Dr. Grant asked a question: "How are the astronauts' space suits cleaned?" It turned-out dry-cleaning fluid was used shortly before the suits were donned, and the solvent fumes were liberated in the capsule during flight.

The NASA episode represents a synthesis of some of Dr. Grant's various interests, so let's go back to the beginning. Dr. Grant was born



W. Morton Grant, MD

July 23, 1915 to William and Vera Grant in Lawrence, Mass. He took what might be called a gap year — at age 13 – to teach himself chemistry and learn plumbing. It turned out to be time well spent. After graduating from Phillips Exeter with honors, he completed his bachelor's degree at Harvard College in 1936 in three years. He was initially poised to pursue further studies in chemistry, but was persuaded by his father, a general practitioner, to study medicine. He graduated from Harvard Medical School in 1940. During his studies, Dr. Grant took an elective with David G. Cogan, MD, at Massachusetts Eye and Ear that was a turning point in his life, resulting in his becoming an ophthalmologist.

Following internship at Henry Ford Hospital in Detroit, Dr. Grant followed an unconventional route to ophthalmology under the mentorship of Dr. Cogan and Dr. V. Everett Kinsey in the Howe Laboratory, Harvard, Massachusetts Eye and Ear – no residency, no fellowship. The world was at war, and as part of the national effort the scientists in the Howe Lab were tasked with finding treatments for mustard gas and other chemical injuries to the eye. Dr. Grant had the interests and background for this project, on which he worked with Dr. Kinsey.

Although the problem proved overwhelming, their efforts gave both men a wealth of knowledge and experience in toxicology and biochemistry and led to Dr. Grant's encyclopedic work, *Toxicology of the Eye,* in 1962, with later editions in 1974, 1986, and 1993. One of the great privileges of my life was to work with Dr. Grant on the 1993 edition of his book. His patience, kindness and mentoring during this process were invaluable to my own development as a clinician-scientist and as a human being.

Dr. Grant, self-educated in ophthalmology, became American Board of Ophthalmology certified – a feat that was remarkable at the time, and would not even be possible today. He was the model clinician-scientist, taking clinical

W. Morton Grant, MD

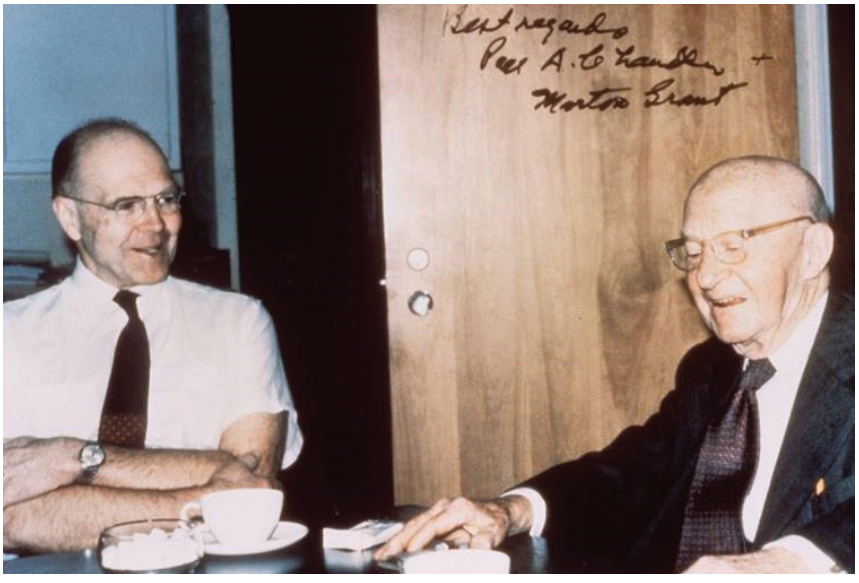
problems to the lab to return with greater understanding of physiology and pathophysiology, as well as clinical solutions.

Early on, Dr. Grant developed a relationship with Dr. Paul A. Chandler, a busy and thoughtful clinician and surgeon in Boston. Their morning meetings in Dr. Grant's lab over coffee were the stuff of legend, where great problems in glaucoma were identified and discussed and studies planned and analyzed, often together with clinical and research fellows, other trainees and lab members. One of Dr. Grant's greatest talents was his ability to explain complex concepts in simple terms, in ways that anyone could understand.

Dr. Grant's clinical activities were mainly geared toward resident and fellow training. In addition, he frequently assisted Dr. Chandler in surgery. The trainees had a hotline to Dr. Grant in his lab on the fifth floor of the Howe Laboratory. When a call came in, Dr. Grant would quickly walk five flights of stairs to the glaucoma consultation service, which Dr. Grant directed 1960-1982 and confirm the history and pertinent portions of the clinical examination, particularly gonioscopy. He was meticulously attentive to detail, and often noted key findings that would guide the patient's management.

Dr. Grant, Patricia Basler and Dr. Joel S. Schuman (L to R), New England Eye Center Library, on finishing the fourth edition of "Toxicology of the Eye." The manuscript is the stack of papers on the right. Patricia Basler, a Howe Lab administrative assistant and then education coordinator at New England Eye Center, was invaluable in the preparation of this work.

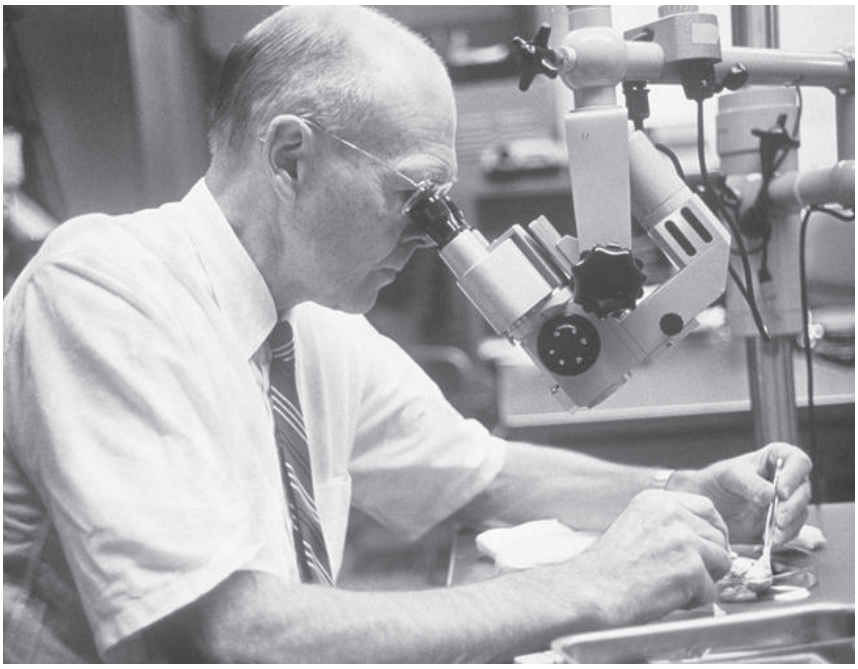
Dr. Grant's education of trainees was always provided with kindness and clarity. If someone missed or mistook a portion of the exam, such as the gonioscopy examination, Dr. Grant, arms crossed, might say something like, "Well, my gosh, I can see how you might think that angle was open, but if you look right here, the angle is occluded by the iris, and, oh, look at that, the iris is attached to the trabecular meshwork all the way around the eye." He would say this sincerely, not sarcastically, as many of us may have experienced during residency or fellowship.



Drs. Grant and Chandler at morning coffee in the Howe Lab. Photograph taken by Marshall N. Cyrlin, MD.

It was this clinical acuity that resulted in Epstein and Grant's identification of heavy molecular weight (HMW) lens proteins as the cause of outflow obstruction in phacolytic glaucoma. A clinical observation by Dr. Epstein, confirmed by Dr. Grant, of cells moving slowly in the aqueous humor of patients with phacolytic glaucoma, as if in a viscous substance, led to experiments in the laboratory using ocular perfusion technology developed by Dr. Grant, proving that HMW lens proteins obstruct outflow and could cause this entity. This is also an example of Dr. Grant (and Dr. Epstein) modeling clinician-scientist behavior. They identified a clinical problem, took it to the laboratory, and proved their hypothesis providing a fundamental understanding of the etiology of this disease.

W. Morton Grant, MD

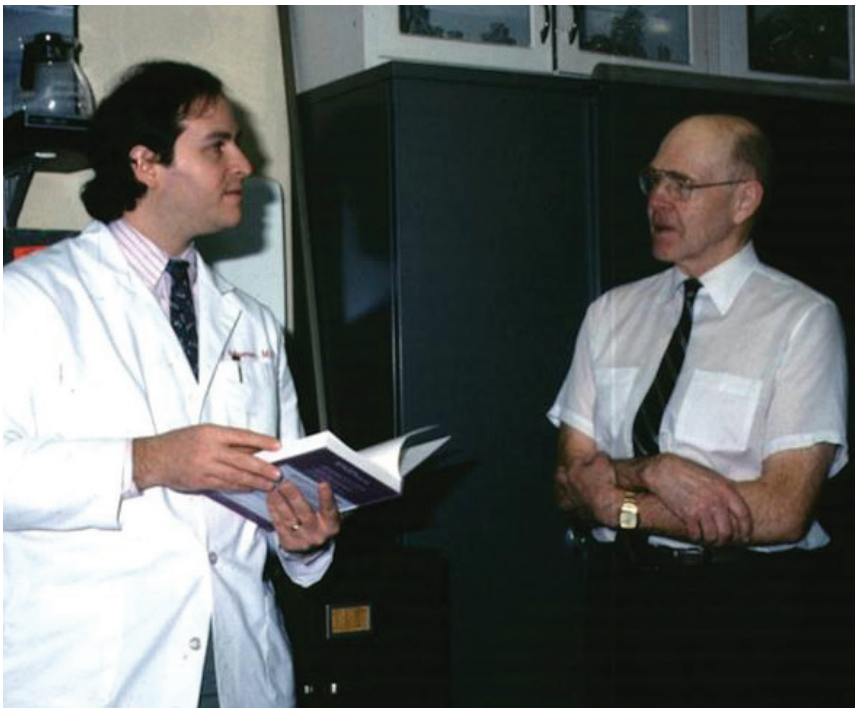


Dr. Grant at the microscope in the Howe Lab, studying a human cadaver eye.

Dr. Grant developed tonography for the clinical measurement of aqueous outflow facility. In this procedure, a weighted Schiotz tonometer is placed on the eye and intraocular pressure is recorded over four minutes. The slope of the decay in intraocular pressure defines the outflow facility. At some point, Dr. Grant noted that the second eye tested often had a lower intraocular pressure than initially measured. He and Dr. Chandler puzzled this out, realizing that it was most likely evaporation during the 4 minutes the eye was open while the other was being tested that caused this.

Dr. Chandler, a Chesterfield smoker; used the cellophane cigarette pack cover over the eye to be tested while tonography was being performed in the first. They found that this solved the problem, and a plastic cover (no longer cigarette cellophane) is still used to this day on the contralateral eye while the first eye is being tested.

To measure outflow facility in the laboratory, Dr. Grant invented several tools and techniques. His seminal studies on aqueous humor outflow facility in enucleated human cadaver eyes elucidated the site of normal outflow resistance in the trabecular meshwork and abnormal resistance in glaucomatous eyes. His work defined the behavior of Schlemm Canal and the trabecular meshwork and their effects on resistance to outflow at different levels of intraocular pressure.



Drs. Schuman and Grant pictured in a conference room in the Howe Lab.

Dr. Grant and Dr. Chandler were highly respected as educators. They demonstrated not only a love of learning, but the values of inquisitiveness, integrity and ingenuity. Their series of lectures at the New England Ophthalmological Society resulted in their book, "Lectures in Glaucoma" published in 1965. The second edition was titled "Glaucoma" (1985), and subsequent editions titled "Chandler and Grant's Glaucoma" (1985, 1996, 2013, 2021).

The book lives on as a case-based approach to glaucoma, integrating clinical patient care and fundamental physiology, pathophysiology, pharmacotherapeutics and surgical approaches.

Dr. Grant received many well-deserved accolades, including the Proctor Medal (Association for Research in Vision and Ophthalmology, 1956); Knapp Medal (American Medical Association, 1961); and Howe Medal (American Ophthalmological Society, 1968). He became the first David Glendenning Cogan Professor of Ophthalmology at Harvard Medical School in 1974.

Dr. Grant was honored with a Festschrift by his trainees at the

W. Morton Grant, MD

New England Ophthalmological Society in 1990. The list of speakers was a who's who of ophthalmology. In 1991, Dr. Grant became a visiting professor of ophthalmology at Tufts University School of Medicine. Dr. Grant's and Dr. Chandler's fellows honored their mentors with the formation of the Chandler-Grant Society (now the Chandler-Grant Glaucoma Society). This group promotes the teachings and life-lessons of Chandler and Grant, particularly integrity, honesty, lifelong inquisitiveness, humility, the priority of patients and kindness.

Dr. Grant provided a life example of the role of the clinician-scientist. His approach to the profession is not often seen today. Generous with his time and wisdom, he was always a gentleman. Rarely effusive, he had a dry sense of humor. His integrity was unparalleled. He disliked the spotlight; in fact, he rarely gave a lecture with slides.

Ironically, he did so when delivering the Robert N. Shaffer Glaucoma Lecture, later published in *Ophthalmology* as, "Why Do Some People Go Blind from Glaucoma," at the Academy's 1981 annual meeting and

Dr. Chandler, a Chesterfield smoker; used the cellophane cigarette pack cover over the eye to be tested while tonography was being performed in the first.

the slides failed to operate properly, disrupting his talk. It is said that he never again used slides in a lecture.

The story of the NASA astronauts demonstrates how Dr. Grant amalgamated his many talents to solve an important and difficult problem. It brought together his clinical acumen, his love of chemistry, his knowledge of toxicology and his skills as a clinician-scientist. All were tied together with Dr. Grant's ever-present humility, speaking only when asked to comment after others had spoken.

Dr. Grant died at 86 in Winchester, Mass. on Nov. 17, 2001. His wife of 65 years, Jeanette (Poirier), died six weeks later. They left two sons, David and Jeffrey, a daughter, Jeanne G. Ancarrow of Richmond, Va. and four grandchildren. Dr. and Mrs. Grant are buried in Richmond near their daughter's home.

Acknowledgements: This article was compiled from obituaries written by Joel S. Schuman, MD; David L. Epstein, MD; E. Michael Van Buskirk, MD; M. Bruce Shields, MD; Simmons Lessell, MD; Claes H. Dohlman, MD, PhD; and Evangelos S. Gragoudas, MD; and existing materials from the New England Ophthalmological Society's W. Morton Grant, MD, Festschrift, March 16, 1990.

Left to right: Martin Wand, MD; Douglas R. Scott, MD; Jeanette Grant; W. Morton Grant, MD; Joel S. Schuman, MD; David L. Epstein, MD, in Dr. Grant's living room.

Life in Retirement: Perry S. Binder, MD, Adjusting to Shifting Goals

By John R. Stechschulte, MD

Authors note: Finding, keeping and sometimes recapturing fulfillment in retirement can be challenging. It is not uncommon for our goals, aspirations, interests, hobbies, recreation, and dreams to change several years after retirement.

An article in the spring edition of Scope introduced my goal to assist members who are planning to retire and members seeking greater joy in retirement. I have interviewed several ophthalmologists who retired about 10 years ago.

Here is Dr. Perry S. Binder's experience.

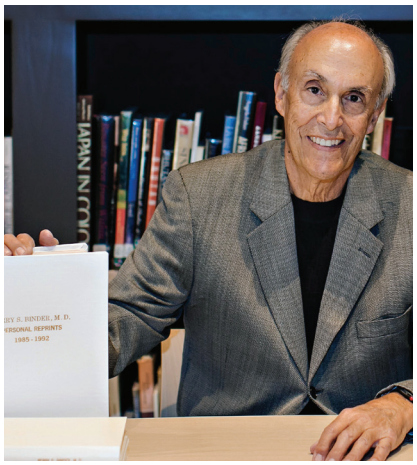
Once I decided to retire, I had planned to continue my career just as it was prior to selling my practice.

Since I considered myself of sound mind and body, I assumed that I would continue as a medical director or adviser for several ophthalmic companies. I would continue writing scientific manuscripts, serve on the same editorial manuscript review boards and continue to accept invitations to speak at scientific meetings as I had during my career. But it didn't turn out as planned.

The last invitation to speak at a formal in-person meeting took place five years later. The companies with whom I had served so well slowly began to depend less and less on my recommendations and opinions even though I remained just as active performing basic science and clinical research for them.

Today I consult for just one company, Aleyegn Inc. Slowly and steadily my involvement in the scientific social media decreased so that by 2015 the only individuals who sought my opinions were my ex-fellows. The number of submitted journal manuscripts I was asked to review decreased dramatically. It was almost as if the ophthalmology world considered my brain to have died the day I left my practice. I had to make some changes.

My first satisfying life modification was to begin writing coffee table books. During my career I was blessed with many invitations to speak all over the world. I had sufficient personal experience and photographs to document these travels. My first book covered the Aegean Cornea meetings from inception in 1992 through 2017. I have now published over 17 books. The one I am most proud



Perry S. Binder, MD

of is my historical review of the Columbian World Exposition 1893 Chicago World's Fair and The White City Amusement Park.

I decided to move from San Diego, where I had practiced from 1974 to 2009, to my Hailey, Idaho home most of the year. I had purchased the house in 1992 but began living there eight to nine months a year, which afforded me time to improve a nondescript golf game and to develop gardening and landscaping skills for two acres.

Physically I was becoming more active than I had been in the last 20 years of my life, but I was still lacking something. I missed the practice of ophthalmology and the camaraderie of staff and fellow ophthalmologists. Although I continued to regularly read ophthalmology journals while updating my ophthalmology reference database using *End Notes*, I still needed something more.

My first and only grandson was born in 2014. His mother is from Mexico and his father is also fluent in Spanish. I had previously failed miserably in using the software program *Rosetta Stone* to learn Spanish to keep up with my grandson. Luckily, I found *Babble* and have now used it about an hour a day three to four days a week. I received the greatest compliment this summer from my grandson: He said, "Poppo, your Spanish is improving."

In spite of many mistakes made during my lifetime, the only one I really regret was not learning a musical instrument. In 2019, I decided this would change. After searching the Internet for programs to learn jazz piano I finally settled on the program, *Piano in a Flash*. I purchased a keyboard along with the program, and now I'm learning how to read music and actually play songs that almost anyone can identify. I also play with my drone photographing the areas around my home in Idaho.

It is difficult for me to believe that I have not performed surgery or treated a patient in 12 years! Hardly a month will go by where I do not have a dream of performing surgery; sometimes these turn into nightmares: whenever I ask the nurse for an instrument, she either tells me she has no idea what I'm talking about or that the instrument is not available. Perhaps I could have volunteered for ORBIS or a similar project.

I miss my staff. I have maintained contact with many of them through Facebook, but I really miss the day-to-day communication and sharing of fun experiences. I do look back on my career with satisfaction at the individuals with whom I have worked; several have subsequently been highly successful in the ophthalmology industry. The only

thing I might have done differently would have been to physically invite these individuals out for drinks or dinner and to maintain closer contact.

In my ophthalmology career I was always very active at the annual meetings of the AAO, American Society of Cataract and Refractive Surgery (ASCRS), European Society of Cataract and Refractive Surgeons (ESCRS) and the Association for Research in Vision and Ophthalmology (ARVO).

Not having new material to present and not receiving invitations to provide summaries or retrospective views of individual subjects, I withdrew from participation which I view as a personal loss. To make up for this deficit, I have shifted my focus to assisting younger, talented ophthalmologists in their clinical and basic science careers and in manuscript editing. This has been a great outlet and a very satisfying modification to my life.

I would strongly recommend that anyone contemplating retirement consider their health in the planning.

HERE ARE SOME RETIREMENT TIPS

Do not wait until you must retire. It may be too late to give you time to do things you have been putting off, be it travel, visiting friends or learning something new. I know several ophthalmologists who are afraid to retire and consequently are working with no real future.

Document your patient stories. I wish someone would write a book about individual patient stories. I have heard many of these anecdotes, some are hilarious and others sad. But each of us can easily remember the "special" patients and their stories. My best advice to those practicing is to remember to ask each patient about themselves. Take time to learn about them as an individual. Some of my favorite experiences came after I placed my pen down and asked the patient about themselves. I remind myself of these stories very often as it provides happiness and satisfaction.

I have two stories in particular to share. The first took place about 10 years after I had been following an elderly lady for a progressive cataract in her only eye. After recommending surgery and its risks and benefits, she rolled up her sleeve and showed me her tattoo from Auschwitz. She told me I would be the first doctor to physically touch her since World War II.

At her final post cataract visit she gave me three videotapes as a present. These were the outtake B rolls from an interview she had for the Holocaust Museum in Washington, D.C. Her story began on Sept. 1, 1939 as she watched German planes begin bombing Warsaw and ended in 1948 when she and her husband escaped from a Russian prison camp and finally made it to New York. I was lucky enough to have shared this life experience with a patient I had seen annually for 10 years, but never took the time to ask about her life.

One day I had finished recommending LASIK surgery to a woman in her late 50s. A man sat in the back of the room whom I had assumed was her husband. I put down my pen and asked, "how long have the two of you been married?" The response was three weeks. She proceeded to tell me that they had dated in high school for three years, but her family had moved to Texas in her senior year while her boyfriend stayed in California.

Many decades later she was divorced, and her husband's wife had died of cancer. As luck would have it, both of their mothers found themselves in the same nursing home. One day they reminisced and remembered that both of their children had dated in high school, so they decided to give each of them their respective phone numbers. At this point the gentleman in the back of the room spoke up. "Dr. Binder, I dialed her number, and when I heard her speak even after three or four words all of my feelings for her returned instantaneously!" He flew to Texas that week and they were married one week later!

Author's closing note: Many times, retirement, like life, does not go as you expected. The Greek philosopher Heraclitus's view of change in 500 B.C. was, "The only thing that is constant is change".

It is clear in 2021, that change is happening at an even more accelerated pace each year. Retirement cannot halt change. So, don't retire to slow down. Instead, when you retire try to move faster to stay ahead of change!

My role models that are beyond 60 years of age, are much like Dr. Binder, in that they have not been overwhelmed by change but instead sought new opportunities in retirement. They have kept an open mind. My wife and I have the most delightful dinners with our children's former and now retired pediatrician and his wife. They are 90 years old, but he tells us about what is happening with the school board, how they are leading a community arts center, what he's doing to be an advocate for children's health and how much fun they have visiting Napa, Calif. as part of a wine club.

As Dr. Alfredo A. Sadun did in our first article on retirement. I also recommend to you the book "Retire Right" by Frederick Fraunfelder, MD. He describes a fourth of four phases of retirement as the most difficult of the periods because we encounter adversities, sometimes in waves. His book shows that we can succeed in all phases of retirement if we work now to master the traits that he describes in these eight chapters: Plan, Accentuate the Positive, Accept Change, Allow Family and Friends to Help, Enjoy Leisure Time, Stay Healthy, Seek Purpose and Have Faith.

Would you like the Academy to make more resources (nonfinancial) available that may help you in your retirement? Have you found resources that have helped you in retirement? We are seeking your assistance in continuing this discussion, so please respond to these questions and email us at scope@aao.org.

The Way We Were: Stuart Fine, MD

Alfredo A. Sadun, MD, PhD

Stuart Fine, MD, served as a professor of ophthalmology and director of the Retinal Vascular Center at the Wilmer Eye Institute until 1991 and then served for 19 years as professor and chair of ophthalmology and director of the Scheie Eye Institute at the University of Pennsylvania.

In 2011, Dr. Fine stepped down from his position at Penn and relocated to Colorado, where he is a part-time clinical professor of ophthalmology at the University of Colorado School of Medicine. He has made several seminal contributions to ophthalmology and has trained many of our current leaders.

Among his many awards of recognition are the Jackson Memorial Lecture, the Lifetime Achievement Award of the AAO, the J. Donald M. Gass Medal from the Macula Society, the Distinguished Alumni Award from the University of Maryland School of Medicine and his presidency of the Association of University Professors of Ophthalmology (AUPO).

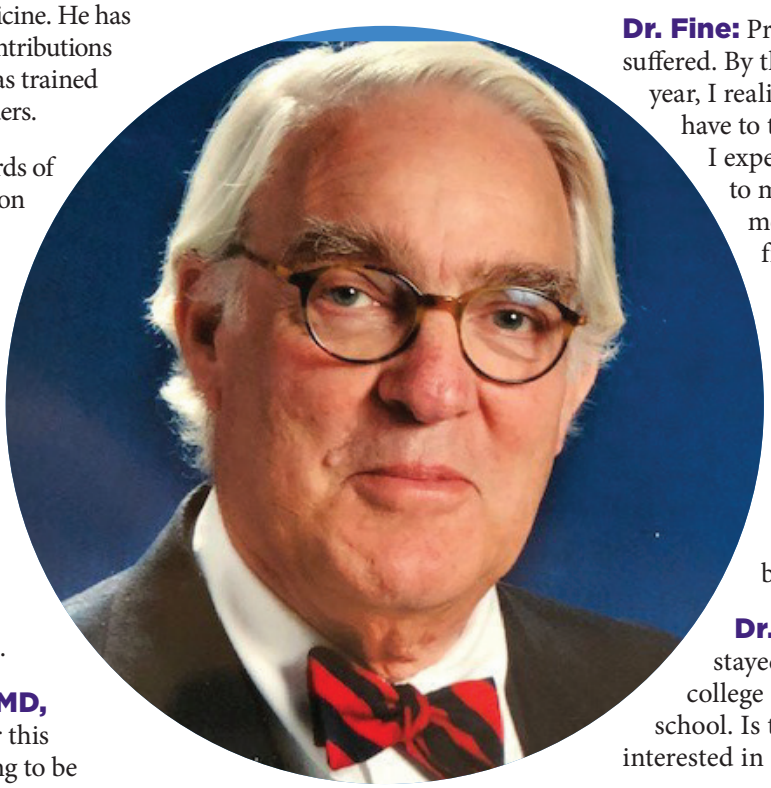
Alfredo A. Sadun, MD, PhD: Stuart, thanks for this opportunity. This is going to be one of a series of interviews with luminaries in ophthalmology that has several purposes. I'll be particularly interested in creating a sense of the world of ophthalmology, particularly academic ophthalmology, when you began your career. Young ophthalmologists, especially residents and fellows, are likely to be surprised to learn how different things were "back then."

Can you start us off with comments about your early life?

Stuart Fine, MD: I was born and reared in Baltimore, MD. My family lived in a safe neighborhood. My elementary school was four blocks from home. We walked home every day for lunch and then walked back to school.

Dr. Sadun: When did you get interested in becoming a doctor?

Dr. Fine: In those days, the 1940s, pediatricians made house calls on sick patients. I was always excited when I knew that my pediatrician would be coming to see me, even though his visit often meant that I would be getting a shot of penicillin. I guess he was my first role model.



Stuart Fine, MD

Dr. Sadun: Tell me about your education.

Dr. Fine: I attended the University of Maryland in College Park, Md., and majored in philosophy which was an unusual major for a pre-med student. Also unusual was that I was just 16 years old when I started college, a full two years younger than most of my classmates.

Dr. Sadun: How did being just 16 affect your college experience?

Dr. Fine: Because of my youth, I had missed out on a lot of social life in high school. In college, I joined a fraternity in my freshman year. Living in the fraternity house exposed me to many distractions, such as nightly ping pong games, poker games and hours of late-night schmoozing. I was making up for what I had missed in high school.

Dr. Sadun: How did all that socializing affect your grades?

Dr. Fine: Predictably, my grades suffered. By the end of my junior year, I realized that I would have to turn up the steam if I expected to be admitted to medical school. I moved out of the fraternity house and became a serious student. Fortunately, I convinced the pre-med adviser and the medical school admissions committee that I had turned the corner and was committed to becoming a physician.

Dr. Sadun: So, you stayed in Maryland for college and for medical school. Is that when you got interested in ophthalmology?

Dr. Fine: Definitely not! Students rotated on the ophthalmology service for just two days! On one day, we did histories and physicals on the inpatients who were scheduled for cataract surgery by the residents. On the second day, we were assigned to the operating room but we were stationed at the foot of the OR table so we couldn't even see the eye! Ophthalmology was not even a remote consideration in medical school.

Dr. Sadun: I'm looking forward to hearing about how you got

to ophthalmology but first tell me about your internship.

Dr. Fine: I was a straight medicine intern at the University of Maryland Hospital. The year included two months of electives and I chose general surgery and urology, unusual choices for a medical intern.

Dr. Sadun: What were you thinking about for residency?

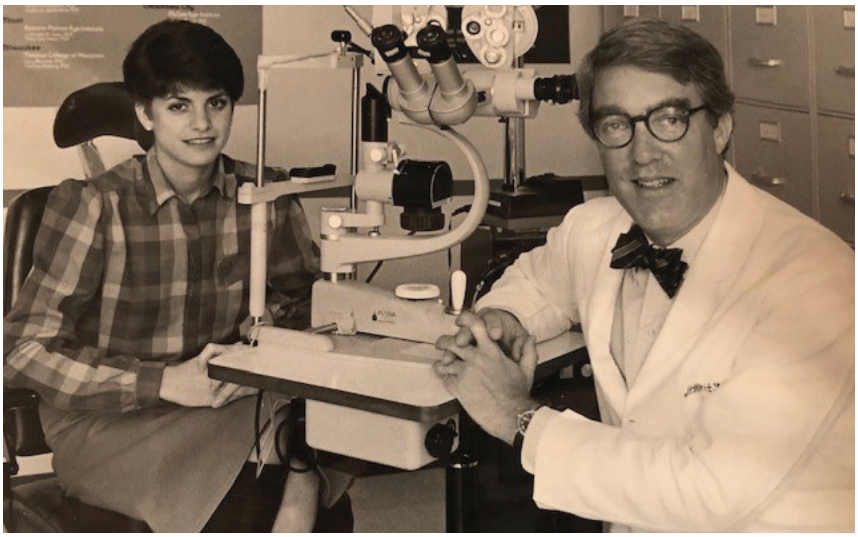
Dr. Fine: I thought that I wanted to be a neurosurgeon. At that time, there was a draft and doctors were eligible to be drafted up to age 35. The Berry Plan was the military's way of assuring that each service (U.S. Army, Navy, Air Force) would have adequate numbers of specialists to meet its future needs. Every year, each of the armed service would defer a certain number of medical school seniors in each specialty in order to meet those future needs. The selection was by lottery. I applied for a deferment in neurosurgery but was not deferred. Not having a deferment meant that most residency programs would not accept you for fear that you might be drafted in the middle of the residency. In 1966, the year that I graduated from medical school, not having a deferment meant that you would be headed to Viet Nam.

Dr. Sadun: So, what happened next? You didn't have a deferment and you didn't have a residency.

Dr. Fine: I was married and had an infant daughter, so obviously, I wanted to avoid going to Vietnam. I made many phone calls and eventually identified a program in the public health service in Arlington, Va. that had an opening for a nonresidency trained generalist. I was accepted to begin a two-year tour of duty beginning July 1967 after completing my internship.

Dr. Sadun: What was your job in the public health service?

Dr. Fine: There was actually not much for me to do although I had an impressive title, an office with a window, and a full-time secretary. I spent most of my time organizing an international symposium on the treatment of diabetic retinopathy that was held at the Airlie House in Warrenton, Va. in September 1968. More about that later.



Dr. Fine with then Hopkins medical student, Beth Bromberg who was taking an elective in ophthalmology.

Dr. Sadun: Having had only two days of ophthalmology in medical school, what did you know about diabetic retinopathy?

Dr. Fine: Not much! I mentioned that I was a generalist in the public health service program. Just down the hall from my office, there was another young doctor who was fulfilling his military obligation by serving two years in the program. He had just completed his chief residency at Hopkins: his name was Morton Goldberg, MD.

Dr. Goldberg became my friend and my mentor. He invited me to accompany him to weekly grand rounds at Walter Reed Army Medical Center in Washington, D.C., on Wednesday mornings and to grand rounds at the Naval Medical Center at Bethesda on Wednesday afternoons. On some Tuesdays, we attended ophthalmology research conferences at the National Institutes of Health (NIH), and on Saturday mornings we attended lectures at the Washington Hospital Center. After a few months of exposure to ophthalmology at that level, with Dr. Goldberg as my mentor, I was ready to apply for a residency in ophthalmology.

Dr. Sadun: This was in 1967, before the ophthalmology match. What was it like applying for a residency then?

Dr. Fine: Crazy! As you might have guessed. Dr. Goldberg guided me as to where I should apply. The programs at Massachusetts Eye and Ear and at the University of Wisconsin were filled for the next three years! I applied to eight programs and interviewed at seven. I withdrew from two programs after the interviews. I was accepted at three programs and chose the University of Florida in Gainesville.

I should mention that I interviewed there in February when it was freezing cold in Virginia. In Florida, everyone was wearing short sleeve shirts. More importantly, I liked the principal faculty in Florida: Herb Kaufman, MD, and Mel Rubin, MD. During my first year there, David Worthen, MD, joined the faculty after completing his residency at the Mass Eye and Ear. Dave was the whole package: compassionate physician, kind and capable teacher, superb surgeon, insightful investigator and a friend to the residents. His untimely pass-

ing from ALS was a huge loss not only to his family and friends, but to all of ophthalmology.

Dr. Sadun: You were being interviewed for a residency in a field where you had never even taken an elective rotation. How did the interviews go?

Dr. Fine: That was not a problem. I had learned a lot of ophthalmology during my two years in the PHS and I had learned especially about diabetic retinopathy because of my role in organizing the Airlie House symposium on the treatment of diabetic retinopathy. With regards to interviews, Dr. Goldberg was again very helpful. I once mentioned to him that I thought there were many similarities between ophthalmology and urology, a service on which I had spent one month during my internship.

Both disciplines cared for men and women, adults and children, both had interesting diagnostic procedures, and both were treatment oriented. I then compared looking at the bladder through a cystoscope with looking at the fundus with an ophthalmoscope. At that point, Dr. Goldberg cringed: "If you mention that similarity during your interview, I can guarantee that you will not get a residency."

Dr. Sadun: Any interesting stories from your residency worth sharing?

Dr. Fine: It was a traditional residency with rotations to all the specialty services, plenty of patients, a wide variety of pathology, good teaching conferences, and capable co-residents. During my chief residency year, Dr. Kaufman asked me to go over to the University of Florida School of Veterinary Medicine to do an eye examination on a racehorse.

The horse's owner from Jacksonville, Fla. was concerned that the horse was continually running into the fence while running around the racetrack. It was obvious from just a hand light exam that the horse had a significant cataract in the left eye. The next question was how to perform a lens extraction on a horse. Should we do an intracapsular extraction which was standard for humans or an extracapsular procedure? Iridectomy or no iridectomy? Steroids or no steroids? Antibiotics or not?

Wedding of Dr. Morton Goldberg and his wife Myrna, April 1968, with Dr. Stuart Fine and his wife Ellie in conversation..

I read several papers in reputable veterinary journals and telephoned ophthalmologists at two vet schools: Cornell and Penn. Unsurprisingly, I got varying opinions. Along with my co-resident, Jeff Horwitz, MD, we performed an extracapsular procedure under general anesthesia. I'm happy to report that the procedure went well and that there were no short-term complications. I do not have long-term follow up so I cannot report whether the horse ever returned to the racetrack and won a race.

But it was a fascinating experience, including watching the administration of intravenous sedation in a vein in the leg and the insertion of an endotracheal tube almost 2 inches in diameter in preparation for inhalational anesthesia.

Dr. Sadun: So, how did you decide to do medical retina?

Dr. Fine: It was my interest in the retina — in diabetic retinopathy in particular — that led me to ophthalmology. By the way, the term medical retina didn't exist at that time. In those days, being a retina specialist meant performing scleral buckling procedures on patients with retinal detachment. I had spent six months on the retina service with Mel Rubin, MD.

During that time, I assisted on more than 200 scleral buckling operations. I didn't love doing those procedures, and I wasn't particularly good at finding all the small holes in patients with aphakic detachments. What fascinated me was the possibility of being able to treat previously untreatable conditions like diabetic retinopathy with laser photocoagulation and visualizing the retinal blood vessels with fluorescein angiography of the fundus.

Just as there was no residency matching program in ophthalmology, there was no fellowship matching program. I sent letters inquiring about a retina fellowship to Drs. Edward Okun at Washington University, Arnall Patz at Wilmer, and Edward Norton in Miami. In my letters, I indicated that I did NOT want to do retinal detachment surgery during the fellowship.

Instead, I wanted to learn about diabetic retinopathy, macular degeneration, retinal vascular occlusions, choroidal nevi and melanoma and angioid streaks. I also wanted to become proficient in interpretation of fluorescein angiography and in performing argon laser photocoagulation, both in their infancy at that time. Dr. Okun called me. He said that he had never taken a fellow who did not want to do retinal detachment surgery and that he already had accepted a retina fellow to start in 1969.

Nevertheless, he offered me a position to start in 1970. Dr. Patz called and offered me the position that I described upon completion of my residency. When I called Dr. Norton to inform him that I had decided to go to Hopkins, he apologized and said he regretted that he had never received my letter.

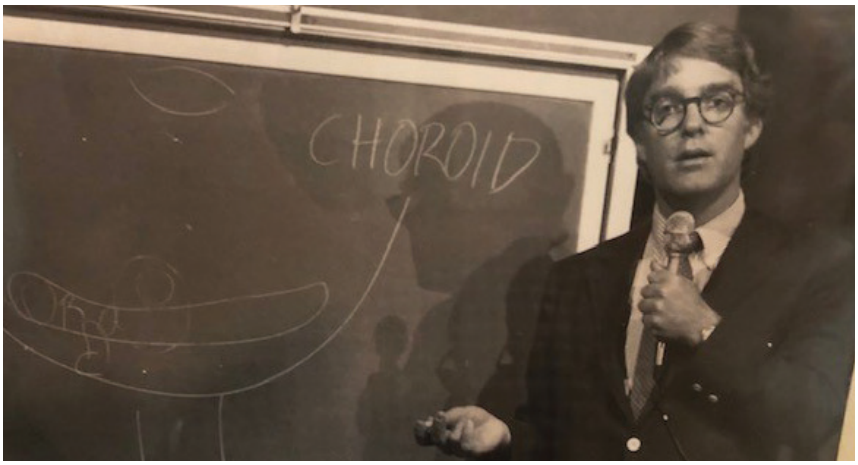
Dr. Sadun: So, you were a retina fellow who did not do retinal surgery. What was your fellowship like?

Dr. Fine: It was fabulous!

Dr. Sadun: And there was Arnall Patz, MD, a legendary figure in ophthalmology. He received the Lasker Award by documenting the relationship between high arterial oxygen and retrolental fibroplasia (now called ROP). What was it like to work with him?

Dr. Fine: Again, fabulous! He always made his fellows feel like they were one of the world's experts. In the presence of a patient that I had worked up, before presenting the history and findings to Dr. Patz, he would say, "Now that you've seen Dr. Fine (or whoever the fellow might be), you're at the very top of the totem pole and you can't go any higher." He also could think on his feet quicker than anyone I've ever met.

Once he asked a patient to leave the laser room because there was an emergency need for the laser.



Dr. Fine lecturing in Lister Hill Auditorium at NIH during a press conference to announce top line results from Macula Photocoagulation Study. Conference was attended by *NYTimes, Wash Post, Wall St Journal* and all major TV networks (May, 1982).

The patient said that she saw a rabbit being taken into the laser room on a gurney and she wondered whether this was the emergency. Arnall immediately explained to the patient that the rabbit was being used to calibrate the laser so that it was now perfect for her eye. The patient smiled and thanked him.

As I mentioned, fluorescein angiography was in its infancy. Dr. Don Gass was publishing regularly about the angiographic features of various maculopathies. And most centers did not yet have an argon laser with a slit lamp delivery system. Consequently, Dr. Patz's service was extremely busy. We saw upwards of 50 patients a day, five days a week and the patients came to Wilmer from all over the country. We also were participants in the diabetic retinopathy study which began just about the time I started my fellowship.

Dr. Sadun: Sounds like a busy year? What next? Did you think about private practice?

Dr. Fine: Since medical school, I thought that I would remain in academics; I admired my teachers and mentors and enjoyed the camaraderie of colleagues and students and house staff.

Dr. Sadun: Tell me how and why you ended up at Wilmer.

Dr. Fine: My fellowship provided me with important skills in fluorescein angiography interpretation and laser photocoagulation which not many retinal surgeons possessed. As a result of having these marketable skills, I had job offers from Drs. Mort Goldberg at University of Illinois, Matthew Davis at University of Wisconsin, Jim Elliot at Vanderbilt and Arnall Patz at Hopkins. All were excellent opportunities, and I likely would have been happy at any of those spots. I decided to stay at Wilmer for two reasons: first, I loved my fellowship and loved working with Dr. Patz and second, Ellie's and my families were in Baltimore. Ellie and I had been married since the end of my second year of med school. We had children ages 6 and 3 years, and both of us had our parents and lots of relatives in Baltimore.

Dr. Fine has been a mentor, a role model, and an inspiration to many leaders in ophthalmology, including those fortunate enough to have worked with him as medical students or residents or fellows. His voice, dapper appearance with his bow tie, stamina and willingness to delve deeply into the pathophysiology of eye diseases have become iconic. I thank him for sharing with our communities his reflections on the start of his career.

Pearls for My Younger Colleagues

By Marguerite B. McDonald, MD

There are many things that we all learn from life, aka as the school of hard knocks. I hope that I am still learning!

Having said that, I have a few things that I would like to share with my younger colleagues embarking on careers in ophthalmology. These things are not in order of importance; they are in the order that they occurred to me in writing this article.

1. Your colleagues are not mind readers; tell them what you want and expect. You might think that it is obvious: everyone must surely know that you want to be president of this organization or be on that committee. They don't. Numerous prestigious organizations are actually looking for interested participants and will be thrilled to hear of your interest. Many of your colleagues may innocently assume that you can't possibly be interested in the extra responsibility because you have a sick spouse or three small children under the age of 6.

They don't know your story: Perhaps you have a family member who is helping you to care for your sick spouse or that your children have four youthful, healthy grandparents who are eager to help you or a dependable nanny. Remember, most people are so consumed with their own problems/issues, that they don't actually spend time thinking about your interests, or your candidacy. In a polite but direct way, tell them what you would like.

2. Learn golf. I surely wish that I had. It is still true that many deals go down on the golf course; MBA students are encouraged to learn to play golf, it is so important. Apparently, there is ample time during a round of golf to chat and get to know one's partners. I am told that this sport is also a great way to determine one's character: honesty, ability to deal with disappointment/embarrassment, ability to play by the rules, competitive spirit, graciousness, anger management, and other attributes. Alternatively, it could help to learn tennis since the same may be said about "chat time" and your colleagues' ability to assess your character.

3. Learn the basic conversation and "eye exam language" of a language spoken by local culturally distinct groups (Spanish, Yiddish, Italian, etc.). Without fluency in this language, you will spend countless hours trying to find a staff member who can translate for you, and each exam will take twice as long, as translation occurs in both directions. The act of translation also removes a bit of the doctor/patient interaction and bonding. Very important. 'Nuf said.

Marguerite B. McDonald, MD

4. Learn to suture with your needle holder and fixation forceps; do not ask for a pair of McPhersons. This is critical for cornea specialists, of course, who spend more time suturing than any other subspecialty. But it is of great help to any subspecialty since it takes much more time to ask for McPhersons and then tie the knot than to simply use the needle holder and fixation forceps to tie the knot. I estimate that it has saved me thousands of hours in the operating room because my fellowship director, Dr. Herb Kaufman, insisted that I learn to do this years ago.

5. The worse the news you have to share, the closer you should sit to the patient. Even with the pandemic, I sit fairly close to patients and often touch their arms. I am even more physical with patients with whom I have bad news to share, i.e., I hold their hands, etc. Patients appreciate it so much; being "hands on" means a great deal to them.

6. Wear a white lab coat. Studies have shown that patients have more faith in doctors of either gender who are wearing lab coats, but especially women, who still need all the help they can get to be taken seriously.

7. Women: wear a pantsuit or slacks when you give a talk. Frequently, you will be seated on an elevated stage, with a head table that is not skirted. You will struggle to keep your skirt modestly in place, as the audience's eyes are at the level of your perineum. You don't need the added stress of this unfortunate situation. Also, use minimal bracelets, as they will clack and clang on the podium during your talk.

8. Be kind and respectful to all your colleagues, even that co-resident who flunked the ophthalmology boards three times and

required special permission to take them a fourth time. There are some people with school smarts, and some people with street smarts.

9. A corollary to No. 8: Be kind and respectful to your junior colleagues, including medical students, residents, and fellows.

10. If you give a talk, thank everyone who helped you with your talk. Be sure to cite — on the slides and from the podium — the authors of any data that you show. Nothing is more upsetting to an investigator than sitting in the audience while one's data are shown, with no credit given (or worse, the wrong credit). That investigator will hold a grudge that can impact your career for decades to come.

11. Learn how to be an effective lecturer. Every ophthalmologist will need to give the occasional talk. This skill also prepares one for interviews with the media, should the need arise.

12. When you enter the exam lane, always introduce your staff member to your patients. Your staff member will appreciate the recognition as a professional, your patients will be more relaxed and comfortable, and you will get a better performance out of everyone.

13. You are not invisible. People are watching you at all times when you are in public, and now they all have phones with cameras. Outrageous behavior will be documented and will spread like wildfire on social media, where it lives forever. But you knew that!

14. When you don't have any idea what to do or how to respond to a situation, do the kindest thing. There is always a kind, elegant, considerate option, even when the other party doesn't deserve it. It strengthens character; others will notice it.

Julia A. Haller, MD.

Notable Dates in Ophthalmology

By Daniel M. Albert, MD, MS

10 YEARS AGO (2011)

At the AAO 2011 meeting, Dr. Julia Haller of the Wills Eye Hospital presented promising results for the treatment of central retinal vein occlusion (CRVO) using intravitreal aflibercept ("Veg-F Trap Eye").

25 YEARS AGO (1996)

Optical coherence tomography (OCT) received wide attention as a new method to quantify structural alterations of the retina and optic nerve with the aim of early detection of damage prior to functional loss.

50 YEARS AGO (1971)

Dr. Donald Pinkel at St. Jude's Hospital in Memphis combined chemotherapy and radiotherapy to obtain cures in patients with the childhood cancer acute lymphoblastic leukemia.

100 YEARS AGO (1921)

The American Optical Company patented an instrument it called the "Lensometer" designed to accurately measure lens power with light.

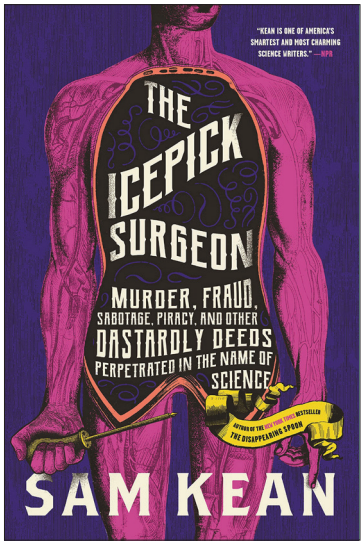
250 YEARS AGO (1771)

Giovanni Battista Morgagni (1692-1771), considered the founder of pathology and the first to describe the "Morgagnian cataract" died.

What We're Reading This Fall 2021

Book Review Editor, Thomas S. Harbin, MD, MBA

Senior ophthalmologists share the best of what they're reading this fall. Share what you're reading and send your review to scope@aao.org.



The Ice Pick Surgeon: Murder, Fraud, Sabotage, Piracy and Other Dastardly Deeds Perpetuated in the Name of Science
By Sam Kean
Reviewed by Thomas S. Harbin, MD, MBA

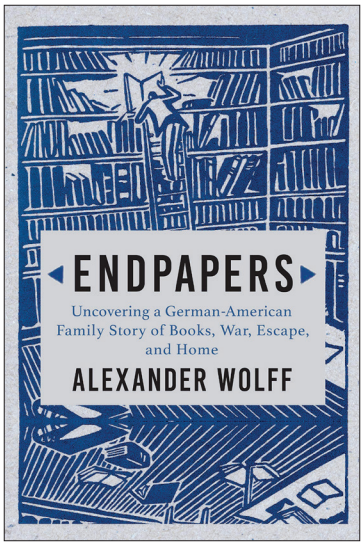
Albert Einstein once said, "Most people say that it is the intellect which makes a great scientist. They are wrong: it is character".

Of the 12 chapters discussing terrible deeds done in the name of science, four are devoted to physicians. Walter Freeman, the "Ice Pick Surgeon" the book is named for, performed a lobotomy on Joseph Kennedy's daughter, Rosemary and went on to perfect transorbital lobotomy. He used an instrument like an ice pick and would perform as many as two dozen a day without anesthesia, gloves or skin prep. He traveled the country teaching the technique at various asylums. It is not surprising that infections, bleeding and even death followed some of these.

Other physicians who employed this technique include Nazi doctors, seven of whom were hanged for war crimes, and those doctors involved with the Tuskegee syphilis studies. Grave robbing and murder at Harvard complete the list.

The other chapters spark interest as well: Espionage, animal cruelty in the name of studying electricity, and bone wars to name a few.

This book reminds us that ethical problems have been with us for centuries.



Endpapers: A Family Story of Books, War, Escape, and Home
By Alexander Wolff
Reviewed by J. Kemper Campbell, MD

Excellent books occasionally arrive serendipitously. An intriguing title noted while browsing a bookstore, an acquaintance's chance recommendation or an obscure reviewer's fleeting mention may cause the reader to open a book he might otherwise ignore. "Endpapers" by Alexander Wolff proved to be one such example for this reviewer.

Despite its eye-catching jacket and a glowing endorsement by an unlikely source, former U.S. Rep. Beto O'Rourke, the deciding factor in beginning this daunting tome was its author. Alexander Wolff was remembered as an elegant writer for Sports Illustrated magazine at its apex, covering the basketball scene and topics as weighty as the 1972 Munich Olympics tragedy. His journalistic gift for giving familiar historical facts a fresh approach has remained intact.

This book is essentially a personal memoir, and readers will necessarily need to refer to the attached and extensive Wolff family tree stretching back to 18th-century Germany to prevent confusion between the multiple characters connected by blood, divorce, and dalliances. The diligent reader will be rewarded by a panorama of the modern history which connects America and Germany from two wars to the present day.

The main protagonists are the author himself, his father Nico and his grandfather Kurt. By the book's end the personalities of all three men have been exposed almost voyeuristically by the family photographs and intimate correspondences available to Wolff.

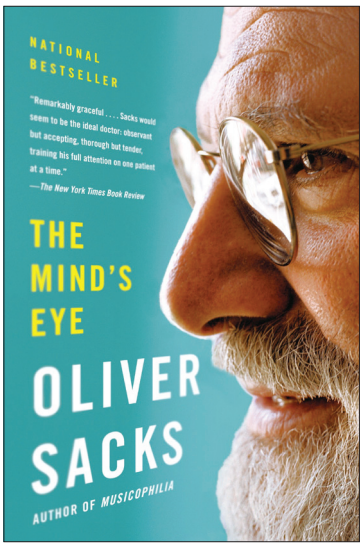
The main protagonists are the author himself, his father Nico, and his grandfather Kurt. By the book's end the personalities of all three men have been exposed almost voyeuristically by the family photographs and intimate correspondences available to Alexander.

Into this complex and intricate family tapestry author Wolff weaves his own search in modern Berlin for a resolution to the guilt he feels from his family's acquiescence with the Nazi extermination of six million Jews. Alexander's conscience is further compromised by his maternal connection to the massive Merck pharmaceutical company which provided the funds for his father to begin his life in America. Merck manufactured the cocaine and Eukodal, an addictive opiate, which fueled Germany's soldiers and eventually Adolph

What We're Reading

Hitler during his megalomaniac final days in his bunker.

This book should appeal to any reader willing to examine the tendrils of guilt attached to any individual by the ghosts of his family's past.



The Mind's Eye
By Oliver Sacks
Reviewed by Alfredo A. Sadun, MD, PhD

We ophthalmologists think that the eye is the organ of vision. But as Goethe said, "What the eye sees is what the brain thinks."

There is a well-known and wonderful writer who looks at vision as a neurologist and as a philosopher. He considers what we see as more than optics; it's about perception and behaving and thinking. You already know of him: Oliver Sacks. He wrote "The Man Who Mistook his Wife for a Hat" and other classics that describe alterations in how the brain organizes perception.

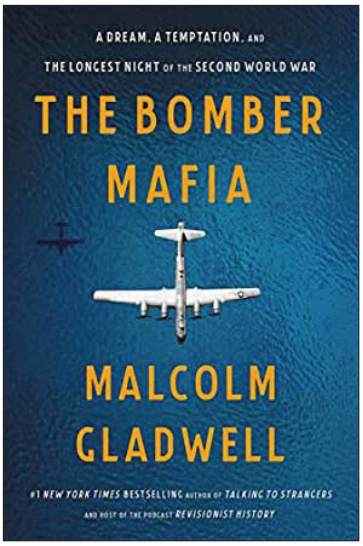
In "The Mind's Eye," Sacks pursues vision related strange syndromes. He describes prosopagnosia, whereby people who see perfectly well can't recognize others, perhaps even their own family members. Sacks also philosophizes. What is seeing? What is perception? How does this effect how we think? This is what Goethe meant. But the best part is when Oliver Sacks provides a rare glimpse from within, for he was also a patient with vision problems.

Dr. Sacks describes the symptoms of his retinal detachment in a way that we will all appreciate. He then describes the diagnosis and treatment of his ocular melanoma. We see the story of his altered perception through the lens of fear and bewilderment. I found particularly useful his description of how he lost stereopsis when he lost vision in one eye.

I knew Dr. Sacks personally, as he was my attending in medical school. I was struck by his careful and precise prose and his delicate sensitivity and respect towards patients. For those who saw Robin Williams playing him in the movie "Awakenings," you'll recognize this side of Dr. Sacks. Knowing this, I once wrote him regarding a recent publication of his. I suggested minor corrections that I, as a neuro-ophthalmologist could nit-pick. Sacks soon sent me back a three-paged typed letter (not computer generated: hand typed!).

This paper contained several typos that were corrected with white-out tape. Other typos had been corrected by hand with white-out after the paper had come out of his typewriter. And then, one word was precisely crossed out by fountain pen and a better synonym used in its place in the margin. Dr. Sacks had high standards for his writing, and it comes across in all his publications.

By the way, a year later, I received from him a package containing a subsequent printing of the book in question with little notes tucked in-between the pages showing how he had revised the work, in response to my nitpicks. Dr. Sacks was a class act.



The Bomber Mafia: A Dream, a Temptation, and the Longest Night of the Second World War
By Malcom Gladwell
Reviewed by Samuel Masket, MD

For those familiar with Malcom Gladwell's earlier bestselling book "Outliers," his fascination with innovators is evident once again in his most recent non-fiction publication, "The Bomber Mafia."

The book's title originates from a small group of military aviators, based in Montgomery, Al. in the late 1930s; they predated the origin of the U.S. Air Force. They were mavericks with respect to the military, having a unique understanding of aeronautics along with their own concepts of the potential value of airpower in warfare. Being technically driven, they believed that precision bombing of vital areas of specific strategic value could assuredly defeat an enemy while greatly limiting civilian deaths. That moral view of prosecuting war was not universally accepted, as others believed that civilians were "fair game" as they manufactured war material.

The "mafia" had opportunity to put their theories into practice with the advent of the "Battle of Britain" at the outset of WWII, employing air counterattacks of German cities while attempting to use the newly developed Norden bombsite. The theory was to

What We're Reading

bomb centers that manufacture ball bearings as war machinery was highly dependent on them.

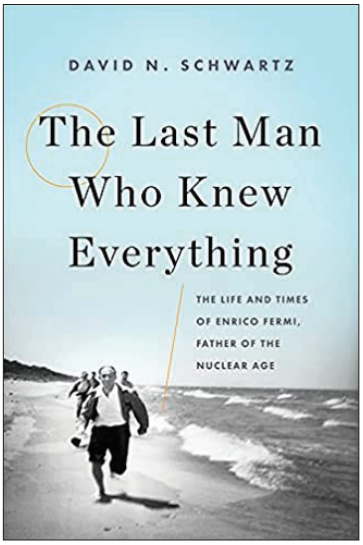
However, the bomb sites failed under the conditions of war and aggressive alternative tactics were initiated by Curtis LeMay who would go on to notoriety later in the Pacific theater of WWII, Vietnam and ultimately as the Air Force Chief of Staff during the Cuban Missile Crisis in 1962.

As we come to learn later in the book, the concept of precision bombing was also attempted in the Pacific. However, there were many obstacles in trying to reach the Japanese mainland either directly from distant islands in the Pacific or from India, flying "over the Hump" via the Himalayas. Weather conditions, limited range of the craft and the "jet stream" all impacted attempts to reach and effectively impact war production.

Once again, the reader is reunited with Curtis LeMay who assumes command of bases in the Pacific and alters attack planning. Simultaneously, the B-29 bomber, with far greater range and capacity than its predecessors, is developed and deployed to the Pacific. Additionally, napalm, (a portmanteau of two of the constituents of the original thickening and gelling agents naphthenic acid and aluminum palmitate) was developed at the same time at Harvard.

It is a viscous (and vicious) incendiary material that sticks to its target at ultra-high temperatures and is intended for firebombing. LeMay conceived a plan to use napalm heavily in attacks on Tokyo that were successful in bringing the war to a close without the need to invade Japan, in theory saving civilian and military lives. However, the attacks on Tokyo killed more people at any one time than any other event in recorded history, including the atomic bombs in Hiroshima and Nagasaki.

LeMay's decisions and seemingly horrific actions remain controversial to this day, although after the war he was honored by the Japanese for bringing the war to a close without invasion. Gladwell again provides much food for thought in discussing the moralities of warfare and whether Le May's tactics did indeed save lives.



The Last Man Who Knew Everything: The Life and Times of Enrico Fermi, Father of the Nuclear Age
By David Schwartz
Reviewed by Alfredo A. Sadun, MD, PhD

Enrico Fermi was indeed the father of the nuclear age. He was the first to create a nuclear "pile" that went critical in a squash court at the University of Chicago. It must have been a heady event. Being the first to create nuclear energy; flirting with disaster; putting the genie in a bottle that would help win World War II.

Fermi was a child prodigy growing up in Rome in the early 1900s. He became a popular young professor of some of the most brilliant minds who came to Rome from all parts of Europe. He received a Nobel Prize in physics for the discovery of new elements induced by neutron bombardment. It later turned out that he was wrong, and he had actually split the atom. The new elements were later revealed to be nuclear fission products. He married a Jewish woman, and that may have contributed to his decision to escape fascism in Italy.

Fermi came to America in 1938, the same year he won the Nobel Prize, and in New York City he found friendship with many of his old physics colleagues. He performed early work that led to the Manhattan Project. From Chicago, he directed the "Metallurgy Lab" that contributed greatly to the development of the atomic bomb. However, what I found most inspiring was his legacy as a brilliant teacher; many of his students went on to win Nobel Prizes themselves.

Author David N. Schwartz earned a PhD in physics from MIT, and he writes knowingly of the mentorship of young physicists. A Fermi post-doctoral candidate knew that he would be assigned, almost every day, trivial but seemingly impossible problems for which they had to apply the "Fermi Method" of back of the envelope approximations to get good estimates. The goal was to use assumptions and estimates to get to within a factor of two in the overall calculation. All three of my children learned to use this method to calculate the number of blades of grass in the high school field or how much an elevator heats up from its occupants.

Fermi attended the testing of the first nuclear bomb at "Trinity". There, he famously applied his method by dropping strips of newspaper in front of the shock wave while observing from many miles away. He paced off the distance they were blown by the explosion and calculated the bomb's yield which later turned out to be within a factor of two. Fermi the teacher inspired all his students who loved and revered him. Fermi enjoyed mentorship most of all. He died young, age 53, with much more than the legacy of the atomic bomb.

News from the Foundation

By Gregory L. Skuta, MD, Chair, Foundation Advisory Board

It was exciting to finally attend AAO 2021 in person. Most of us had not seen each other in person in two years. A lot has happened in that time, aside from the pandemic—graduations, weddings, babies, moves and retirements. I enjoyed catching up with those of you who came to New Orleans and celebrating our successes, not only in our careers, but in life.

ORBITAL GALA 2021: A SOLD-OUT SUCCESS

Despite our hardships, there's so much to celebrate. This year's gala honored David J. Noonan, former Academy deputy executive vice president, for his numerous contributions to our profession. Those of you with tickets for the in-person event enjoyed cocktails, hors d'oeuvres, camaraderie, entertainment and surprises. This year's auction was the most dramatic ever, featuring unique Conversations With Legends including actors Meryl Streep and Gordon Clapp; authors Robin Cook and Jody Picoult; Nobel Prize winner Michael W. Young, PhD; and NBA Hall-of-Famer Rick Barry, as well as pilots, a rock 'n' roll manager, scholars, and of course, many of our own ophthalmology luminaries! We look forward to seeing you at the 2022 Orbital Gala in Chicago.

NOW IS THE TIME TO HONOR YOUR MENTOR

The Foundation's Honor a Mentor campaign gives donors an easy, meaningful way to pay tribute to those who have made a positive professional impact on our lives while supporting Academy programs. Join George A. Williams, MD; Jane C. Edmond, MD; Cheryl L. Huey, MD, David F. Chang, MD; myself and others who have honored their mentors. Donate to your fund of choice and tell us what your mentor or colleague has meant to you.

INCLUDE THE FOUNDATION IN YOUR GIVING TUESDAY (TODAY) AND YEAR-END GIVING PLANS

The Foundation is pleased to kick off the giving season today, Nov. 30, with Giving Tuesday. Donors can join the global movement by supporting one of the Academy's many educational, service and quality of care programs.

As we say goodbye to 2021, we ask you to consider a year-end gift. Your generosity of a tax-deductible donation by Dec. 31 will help sustain the ONE® Network, IRIS® Registry, EyeCare America®, and more — and create a better future for the patients we serve. Make a gift at aao.org/donate.

2021 ANNUAL REPORT: FUTURE FORWARD

Read the Foundation's annual report, *Future Forward*, to learn how, despite the COVID curveball, the Foundation was able to exceed our goals, closing the Museum of the Eye™ campaign and holding the most successful Orbital Gala ever. Donor Spotlights highlight why Jane C. Edmond, MD; Stella L. Luo, MD and Sunir J. Garg, MD; and James V. Mazzo make the Academy Foundation a priority for their charitable giving.

Thank you again for your continued support of the Academy Foundation. I wish all of you a delightful holidays and a happy, healthy new year. I love to hear from you. Feel free to contact me any time at gskuta@aao.org.

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