



SCOPE

Frederick Blodi, MD

Christopher F. Blodi, MD, and Barbara A. Blodi, MD

Frederick Blodi was born on Jan. 11, 1917 in Vienna and grew up in the southern suburb of Maria Entzesdorf. His father was a corporate lawyer for the large multinational construction firm, the Nobel Dynamite Co.

While in kindergarten, Dr. Blodi met his high school sweetheart and future wife, Otilie. Following graduation from the “gymnasium” (“high school”), Dr. Blodi enrolled in the University of Vienna Medical School, graduating in 1940. Near the end of medical school, he was drafted by the German Wehrmacht (Austria had been annexed into the German Third Reich in 1938) and put into an anti-tank unit.

Such units were known for sustaining extreme casualty rates in combat. After six months, Dr. Blodi was released from this unit and placed into a medical corps until graduation. After graduation, Dr. Blodi trained in pathology and general surgery. While assisting and providing anesthesia he was able to sample all surgical specialties. His experiences with the famous retinal surgeon, Karl Safar, led Dr. Blodi to choose a residency in ophthalmology at the University of Vienna.

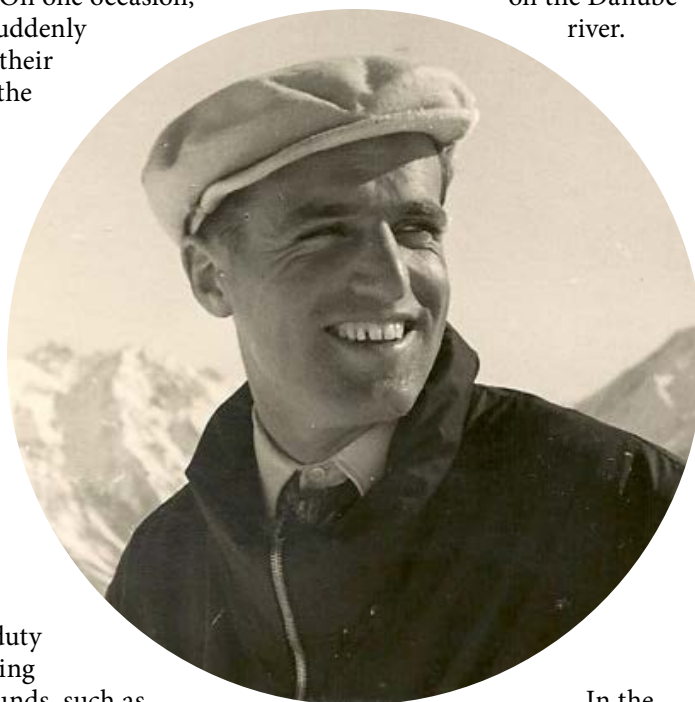
During the latter years of World War II, Dr. Blodi recalled that he and his colleagues would eat lunch on the lawn outside the university

hospital, enjoying the sight of Allied bombers flying northward overhead, en route to their targets in Germany. On one occasion, the doctors suddenly realized that their hospital was the target of the bombs and had to rush inside to help move patients into safer locations.

As the war ground on, many Austrian soldiers attempted to avoid active duty by self-inflicting disabling wounds, such as arm or rib fractures. Dr. Blodi was recruited to help such efforts by a young woman he had previously treated for a skiing injury. Dr. Blodi provided others with ether anesthesia and instructions as to how to break their own bones.

Why did he do such a thing? Gunter von Noorden, MD, a German-born and raised ophthalmologist who trained at Iowa in the 1950s recalled that Dr. Blodi told him: “I just felt so sorry

for those boys, who[m] I knew would be killed sooner or later in this war.” For this anti-war effort, Dr. Blodi was arrested in 1944 and convicted. He was sentenced to serve eight years in the Nazi-run military prison in Stein, on the Danube river.



In the chaotic days of April 1945, as the Soviet army began to sweep into Austria, the prison guards abandoned their posts. The prison commander allowed the cells to be opened and the prisoners freed. Almost all of the prisoners left on foot, only to be massacred when SS soldiers encountered them in the nearby small town of Habersdorf. Dr. Blodi survived because he had stayed behind in the prison to help tend to sick and infirm prisoners who

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were not able to leave their beds, as he had become the de facto doctor for the inmates. These remaining prisoners, including Dr. Blodi, were again placed under Nazi control and moved to the town of Suben.

When the Allied forces liberated Suben, the remaining prisoners were freed. Dr. Blodi recalled that he and another prisoner took a small boat and floated and rowed their way downstream to Vienna. Dr. Blodi returned to the hospital where he had previously worked (the Allgemeines Krankenhaus) and was allowed to go back to his former duties. Vienna, like Berlin, was divided into four parts to be controlled by the American, Soviet, British and French allied forces. By this time the hospital had been placed under British army control.

It was at this time that he again met his fiancée, Otilie Schmakal. Because of the threat of impending war, Otilie had moved to New York City in 1938, where her mother had moved after remarrying. While in New York, Otilie became an American citizen, enlisted in the Women's Army Corps and served as a translator after the war, helping interrogate German officers in Germany and Austria. She and Dr. Blodi had not been able to communicate throughout the war years, and Otilie did not know if Dr. Blodi was even alive or where he might be. She went to Vienna and to the hospital where he had always worked and simply found him there. Shortly after, in 1946, the two were married in the Imperial Chapel in

Vienna. As Schmakal was still an American soldier, permission had to be granted to marry an Austrian by her commanding officer, Gen. Mark Clark.

In 1947, Dr. Blodi was selected as one of the first United Nations World Health Organization fellows. Allowed to choose anywhere to continue his medical training he picked New York City. This was because his wife had lived there and loved New York and because the only Austrian ophthalmologist that he knew of in the United States – Ludwig von Sallman – was in New York at the famous Harkness Eye Institute, a part of Columbia University and the Columbia-Presbyterian medical complex. Dr. Blodi and his wife sailed to New York separately per military regulations in November 1947.

Dr. Blodi became a research fellow with renowned ophthalmologist, Algernon Reese, MD. Reese was most well-known for his work in ocular oncology, including choroidal melanoma

and retinoblastoma, but also maintained a busy general ophthalmic practice and frequently saw celebrities from worldwide destinations. In many ways, Reese was probably the most sought-out ophthalmologist of his time. Initially, Dr. Blodi worked in the pathology laboratory, but quickly added clinical and surgical time with Reese. Reese's legendary gentlemanly Southern style included inviting Dr. Blodi to join him in various sports activities: tennis, swimming at Reese's pool, etc.

One day in the pathology lab stood out from all of the others. Various patient cases were being reviewed by analyzing the microscopic pathology. During the discussion of one slide, Reese turned to Dr. Blodi and asked, "Fred, what do you think?"

Dr. Blodi was astonished. He recalled "never before had a man of such eminence asked me for my opinion." This was in marked distinction from his experiences in Europe where the higher-ups of the department never asked for an opinion from the younger physicians. In fact, it was often frowned upon for the younger doctors to even ask their superiors questions about patient care. Dr. Blodi realized that this open form of communication was far better for both medical education and patient care.

During the late 1940s, clinicians noted that an apparently new retinal disease was affecting prematurely born infants. Many children were blinded by what was termed retrolental fibroplasias (RLF, now called retinopathy of prematurity or ROP). Babies Hospital

Otilie and Dr. Frederick Blodi

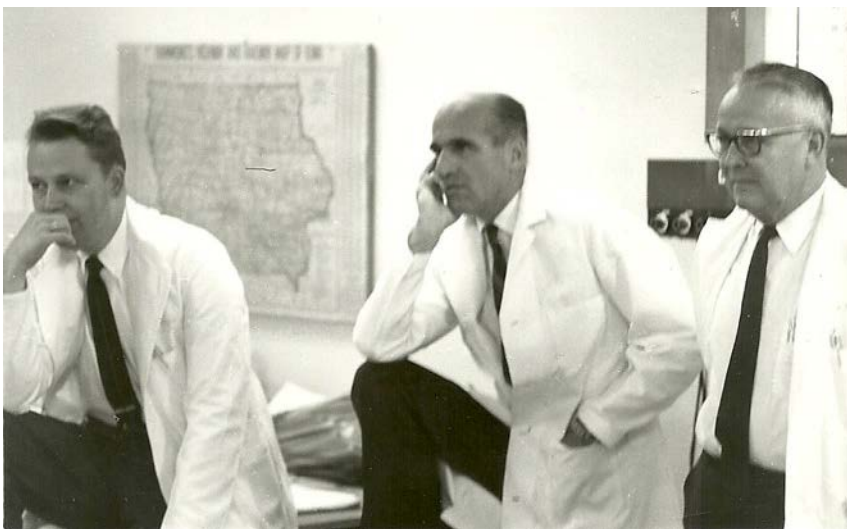


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on the Columbia-Presbyterian medical campus was already a well-respected site for neonatal care, mainly due to the pioneering work of pediatrician William Silverman, MD. Silverman and Reese recognized the need to screen prematurely born infants for this new condition, and Dr. Blodi was selected to perform the examinations, both at Babies Hospital and at affiliated Lincoln Hospital in the Bronx. On Feb. 15, 1950 Dr. Blodi noted in the chart of an 8-week old infant: “increased tortuosity of (retinal) veins!” This was the first case of RLF seen in New York.

Dr. Blodi suggested treating this infant with the new “wonder drug” ACTH. With ACTH treatment, the infant’s eyes “returned almost to normal,” and the child was discharged. A clinical trial of ACTH therapy was instituted at Babies Hospital and many children did well with regard to their retinas, although the drug caused numerous severe systemic side effects. Untreated infants at Lincoln Hospital seemed to fare worse. Then Dr. Blodi made a remarkable observation: Some affected, but untreated infants were found to have spontaneously regressed disease. This prompted a more careful and longer-term study which showed that the drug had no true effect on the retina and, in fact, caused more systemic side effects, including higher death rates. Only later would high blood levels of oxygen be implicated in the cause of the disease.

During this happy and productive time, Dr. Blodi suffered yet another fatal setback. While giving an oral presentation Dr. Blodi began to cough and could not stop. He had to terminate the talk and was hospitalized. The diagnosis of laryngeal tuberculosis was made. Dr. Blodi was transferred to the world-famous Saranac tuberculosis center in upstate



Morning rounds at the University of Iowa, circa 1960s. Left to right: Robert Watzke, MD; Frederick Blodi, MD; and Alson Braley, MD

New York. It was here that he was cured of the disease when streptomycin therapy was instituted.

Dr. Blodi continued academic work while at Saranac. His Harkness Eye Institute colleague, Ira Jones, MD, recalled that Reese and Dr. Blodi would correspond by mail on research and publications. As was typical of Reese’s generous personality, Reese would often visit Dr. Blodi and would frequently press money into Otty Blodi’s hands when he departed.

In 1952 Dr. Blodi realized that he might have to leave New York. He could not obtain a permanent medical license from the state because his medical school transcript seemed to be short of the required years. This had occurred because of the compressed schedule and full-year calendar used in Vienna during the war to more rapidly educate physicians. Dr. Blodi interviewed at medical centers outside of New York. The most compelling job offer came from Dr. Alson Braley at the University of Iowa. While at Columbia, Braley had befriended Dr. Blodi, and Dr. Blodi said that “never before had I met anybody with such infectious optimism, cordiality and obvious honesty. Well, I just had not met a true Midwesterner before.” Dr. Braley had recently returned to his home state of Iowa as the chairman of the

department and offered Dr. Blodi a faculty position. Dr. Blodi accepted immediately and by November 1952 was in Iowa City, Iowa.

Dr. Blodi’s move to Iowa City heralded the start of another phase of his career, one which included becoming department chairman in 1967 and president of the American Academy of Ophthalmology in 1979 when the organization split away from the otolaryngologists. Dr. Blodi began his academic career as the ophthalmologist-in-chief for the Veteran’s Hospital in Iowa City, where he grew to love clinical teaching. For example, Dr. Blodi started weekly ocular pathology quizzes for the residents. When there was an especially difficult pathology case for the residents to solve, he would bring in a six-pack of beer to any resident with the correct answer. He also organized tennis matches and monthly poker games that helped bond the faculty, fellows and residents within the Department of Ophthalmology.

In 1994, Dr. Blodi suffered a disabling stroke. On Oct. 30, 1996, he died in Iowa City after a second stroke. Dr. Blodi will always be remembered as someone who welcomed physicians from around the world with open arms, some as visitors and some as new faculty, and who also brought residents and faculty together.

From the
Editor's
Desk



Our Contribution to Health Care Costs

M. Bruce Shields, MD

As seniors, we seem to get a lot of blame for the escalating cost of health care in the U.S. Yet recent evidence suggests that just the opposite may be true, at least in the area of heart health. That is good news not only for us, but also for the economy of the country.

At the turn of this century, economists were predicting

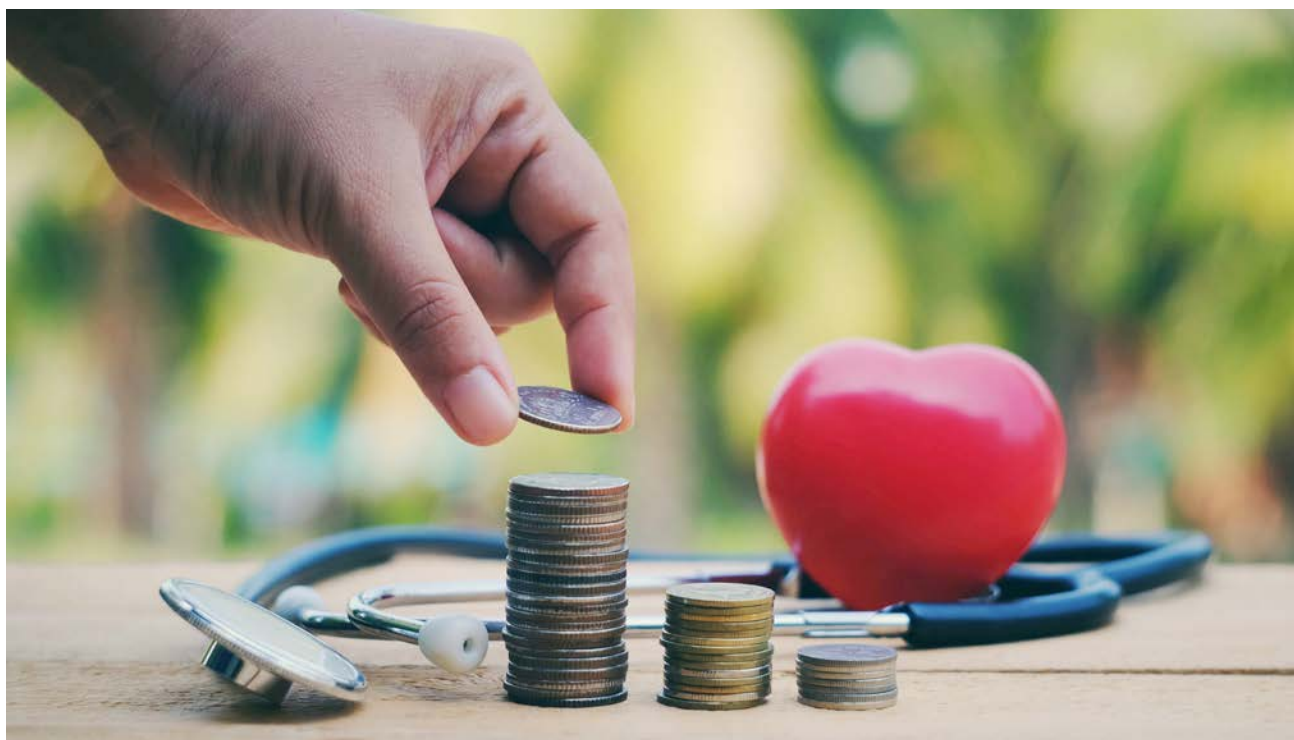
that continued growth of health spending would soon be out of control with disastrous consequences on the federal budget. Yet ironically, there has been a dramatic slowing in all sectors (Medicare, Medicaid, private insurance and out-of-pocket) health care spending. It turns out that the vast majority (about three-quarters) of the slowdown in spending can be attributed to us seniors. So what explains this phenomenon?

What does not seem to account for the slowdown is either the recent Great Recession or the Affordable Care Act, since the slowing of health care spending predates both and has continued since the recovery from the recession. Could it be that we seniors are doing better with preventive medicine, especially in the area of heart health? This would actually fly in the face of most studies, which suggest that preventive medicine doesn't save money. Yet that appears to be exactly what is happening in the area of cardiovascular health.

A study led by Harvard economist Professor David M. Cutler

focused on medical spending for senior citizens, and a breakdown of patients into disease categories showed that by far the greatest slowdown in spending was related to cardiovascular and cerebrovascular conditions. In addition, data from the Centers for Disease Control and Prevention show that death rates from cardiovascular disease among seniors has declined dramatically. The take-away message is that preventive medicine, at least in the area of heart health care among seniors, is working not only to keep us living longer and better, but also to keep our federal budget healthier. And that's good news for all of us.

Of course, we know that preventive medicine includes a healthy diet, exercise (no matter our age), avoiding tobacco products and taking our statins, anticoagulants, anti-hypertensives, diabetes medications and whatever else our doctors feel is in our best interest. So, keep up the good work, and hopefully we can all not only make the most of these golden years, but also contribute to a healthier federal economy.



Reflections of Bernard Becker, MD

Ralph S. Riffenburgh, MD

I enjoyed the article on Dr. Bernard Becker, but I couldn't let pass the statement that there were no residencies at Washington University until he came.

I trained at Washington, returned as a full-time faculty member and was there at the time Dr. Becker arrived.

Following World War II, there was a high demand for training, and a number of hospitals started residencies with adequate clinical experience, but no real basic academic training.

To help this problem, the University of Pennsylvania and Washington University opened one academic year programs to provide a good foundation in basic ophthalmology. Richard Scobee, MD, ran the Washington program, and it did an excellent job. I entered this program in 1948 and there was an excellent residency program with six residents as well as the 12 academic students.

The first-year residents sat in with the academic course students for their basic training. Stanley Truhlsen, MD, was one

of the graduates of this residency program. The reading and being quizzed on Duke Elder, which George Bohigian, MD, mentions, was part of the academic program.

After the course, I spent another year in St. Louis and left for further training at Wills Eye Institute. However, the Korean War started, and I went to Mare Island Navy Hospital rather than Wills and was the only ophthalmologist for the 600-bed general hospital that received many of the Navy and Marine casualties from Korea.

For one year, I attended the two-times-a-week evening course for residents, put on jointly by Stanford University and University of California San Francisco. It was excellent, with a wide variety of faculty interests.

After two years of Navy experience, I had passed my boards, but felt I needed some broader experience and wrote Dr. Post, then the head of the Department of Ophthalmology at Washington University, for advice. At this time, I believe that there were only two fellowship positions in

the country – retina in Boston and pediatric in St. Louis.

One full-time instructor had just left, and Dr. Post offered me the job. I was looking forward to working with Dr. Scobee, but he died of a heart attack at 38 just before I went to St. Louis, and I was given some of his clinics.

Ted Sanders, MD, the eye pathologist, was named acting head when Dr. Post had a stroke, and I did most of the pathology until Bernard Becker, MD, came and Dr. Sanders went back to pathology. The academic course was Dr. Scobee's baby, and neither Dr. Sanders nor Dr. Becker had much feeling for it. It died within two years.

I agree with Dr. Bohigian that Bernie Becker was a remarkable mind, one of the best I have known. I won't say the best, because practicing in Pasadena, Calif. with connections to the California Institute of Technology, I had as teachers, patients or friends such men as Thomas Hunt Morgan, Linus Pauling, Richard Feynman, David Baltimore, Max Delbruck and Roger Sperry, all Nobel prize winners.

I worked with Dr. Becker on a couple projects, and he wanted to send me to Boston for a year with the Schepens Eye Research Institute and then to start a retinal service in St. Louis. I also had offers to practice in St. Louis, but my wife and I had both always wanted to live in California and decided to go to Pasadena in private practice. (By the way, the doctor who started the retinal service in St. Louis had a huge practice and died in six years of a heart attack.) After that, I practiced in Pasadena for 60 years and treated and taught eye pathology at Doheny Eye Institute.

I agree with Dr. Bohigian: Dr. Becker had a remarkable intellect, was an outstanding teacher and a genuinely nice person, and I feel fortunate to have known and worked with him.

Bernard Becker, MD



Walter H. “Terry” Marshall, MD, Preserving Sight and Our Heritage

M. Bruce Shields, M.D.

The annual meeting of our Academy in San Francisco this fall promises to be especially memorable with a preview of the Truhlsen-Marmor Museum of the Eye™, details of which can be found in this and the previous issue of *Scope*.

With the rich history of our profession and the vast array of instruments and devices that have come and gone, there is fertile soil for museums as well as personal collections. Many of us undoubtedly have various collections of eye-related artifacts. I have enjoyed collecting antique eyeglasses, although my humble little collection pales in comparison to the remarkable collection of our colleague, Walter H. “Terry” Marshall, MD.

For many of us, our hobbies or avocations began or at least picked up later in life when the demands of our practices eased off, allowing more time to pursue additional interests. But Dr. Marshall and his wife, Jean, have been collecting antiques all of their 56 years of marriage.

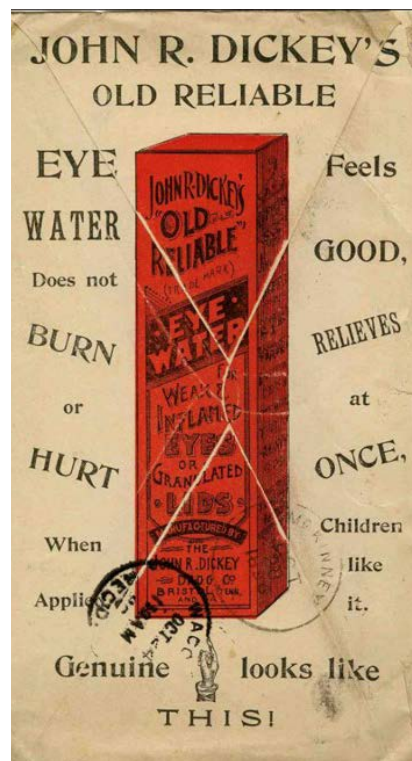
In fact, it began on their honeymoon, when they found a “sad old iron.” They both love old things and have numerous collections – “his, hers and theirs” – and have been involved in multiple historic preservation projects over the years. Even where they have lived and worked are relics of the past. The office in Gainesville, Fla., where Dr. Marshall worked for 33 years, was in a restored 1882 Victorian house. He also restored a former 1899 country store as a satellite office in Melrose, Fla., and they presently live in an 1880s home.

But, of all Dr. Marshall’s collections and preservation projects,

the most amazing is his optical collection, which includes exam instruments, spectacles, trade signs and catalogs, advertising and many examples of medical quackery. And, again, it began very early in his career.

After earning a Bachelor of Science in electrical engineering and his medical degree, both at the University of Florida, he completed his internship and a nephrology fellowship at Duke University Medical School before serving in the Army for two years. He then returned to the University of Florida for his ophthalmology residency, and it was during this time that he acquired his first eye-related antique.

It was on a trip to Maine that he found a circa 1920s Spencer Optical Ophthalmoscopic Test Lens, a self-test device to help individuals determine the lens power they need from a selection of over-the-counter eyeglasses. Despite his vast collection in

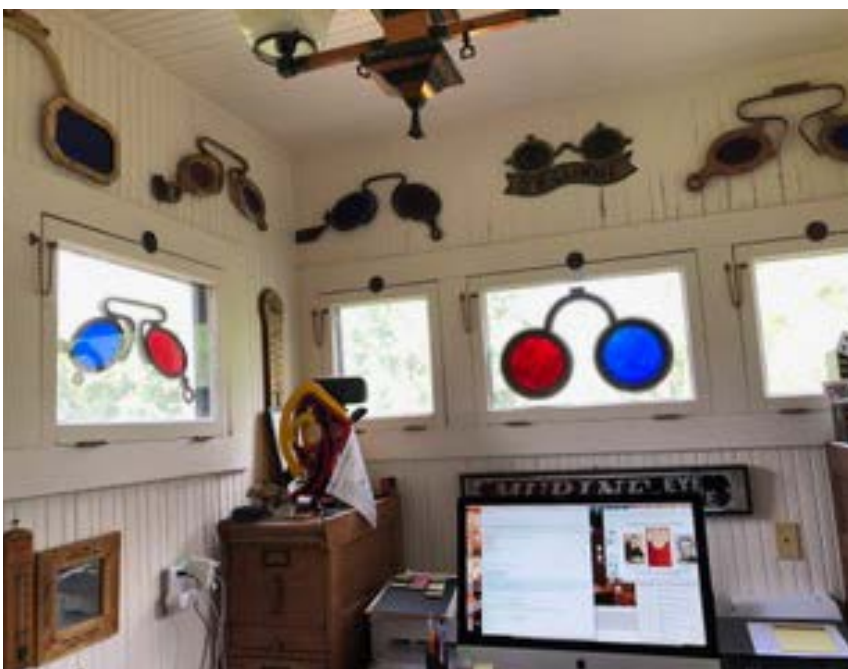


Courtesy of the Ocular Heritage Society.

the decades to follow, he says he has never seen another like it.

In 1981, Dr. Marshall, who was just five years out of his residency, accepted the advice of his mentor, Melvin Rubin, MD, and took his “dog and pony show” on the road. By now he had a considerable collection of ocular artifacts.

Dr. Marshall’s office showcasing some of his ocular antiques.



Walter H. “Terry” Marshall, MD

“And so,” Dr. Marshall recounts, “we hitched a small trailer to our Ford station wagon and headed out for Atlanta and the American Academy of Ophthalmology’s annual meeting.” Upon arriving, they were instructed to follow the exhibitors path to the World Congress Center parking area.

“We felt like the Griswolds, parking our Ford between the 53-foot semitrailers,” he continues. “Using artifacts from my collection, we recreated a turn-of-the-20th century eye doctor’s office in the booth. To my surprise, I was interviewed by Jeff Levine on the then recently created CNN news program during its coverage of the meeting.”



As Dr. Marshall’s collection grew over the years, he developed a special interest in medical quackery, for which he has numerous advertisements and trade signs, many in the form of large eyeglasses. He is a founding member of the Ocular Heritage Society, where he has given many presentations. He is also a member of the Cogan Ophthalmic History Society, where he has also spoken, and the Ophthalmic Antiques International Collector’s Club. His presentations have had intriguing titles such as “Dr. J. Ball’s Eye Cups,” “J. Stevens Cornea

Restorer,” “Neu Vita Oculizer,” “Natural Eyesight System” and “Eye Vitalizer.”

Since his retirement in 2015, Dr. Marshall has been able to spend more time with his hobby, photographing and cataloging his collection. He plans to donate some artifacts to the University of Florida Department of Ophthalmology. In 2018, the History Channel featured Dr. Marshall on its American Pickers television series in an episode called “An Eye for Picking.”

To see more of his work, in addition to the illustrations in this article, you can watch the television feature, [Season 18, Episode 57, on YouTube](#).

As a member of the American Academy of Ophthalmology, Dr. Marshall also served on the Muse-



Dr. Marshall looking at artifacts.

um of the Eye Collection Committee and plans to donate some of his artifacts to the Academy.

As you visit the Academy’s Museum of the Eye in San Francisco in years to come, you may well see some of Dr. Marshall’s amazing life work.

Jean and Dr. Terry Marshall



A Home of Its Own

Norman B. Medow, MD

Co-chair of the Academy's Museum Program Committee

In 1980, with the foresight of a few, the American Academy of Ophthalmology's Foundation first conceived of a museum. The idea was to preserve our ophthalmic heritage, in part, so that by understanding our past, we could improve on our future. We would be able to better understand how the evolution of instruments and education had proceeded.

In 2020, an appropriate year for vision and 40 years after its birth, the new Truhlsen-Marmor Museum of the Eye™ will have a space it can truly call its own on San Francisco's waterfront. From little acorns, tall trees will grow.

From the outset, the Academy formed a committee of museum directors whose job was to aid in the guidance and development of the museum. The committee meets each year at the Academy's annual meeting. The first exhibit was shown at the 1982 annual meeting. An agenda item since that first meeting was the committee's hope

to achieve its own version of the great American Dream, namely, to obtain a home of its own.

The artifacts, now approaching 40,000, have mostly been warehoused, with small exhibit areas at the Academy headquarters in San Francisco or viewable online. Having a space of its own, a true home open to the public for viewing objects in the collection, educating visitors about how the eye works, developing outreach exhibits and expanding its availability in aiding researchers, is paramount in our thoughts.

Because of Academy leadership and the philanthropy of Drs. Stanley Truhlsen and Michael Marmor, the former art gallery space on the ground floor of the Academy building in San Francisco will house the new museum. With the new space also comes a new name, the Truhlsen-Marmor Museum of the Eye, acknowledging our major donors and the museums primary focus: the eye.

For the public, the ability to visit a space with artifacts that have been used for exploring the eye, to understand the visual system, learn about ophthalmology and the treatment of eye disorders will be a unique and creative addition to the museums of the world.

For the medical community, the space will expand the availability of the collection to scholars and researchers so that they may better understand how their forbearers evolved their ideas and instrumentation, and perhaps glimpse at where we are going. Young adults, a focus of the museum, will have the opportunity to learn about the eye and the visual system in ways that have not been available to them in the past. Interactive exhibits onsite and hopefully an expansion of our traveling exhibit program will bring a "sparkle" to their eyes as they view the wonder of sight and learn about its workings.

To me, the museum will be the fulfillment of a 40-year dream come true. As a college and then a medical student, history has always been a passion. I read about the past and then started

collecting medical items. When asked to join the museum committee I was overjoyed. Now, the committee, its members, donors and friends will see its home become reality. Come and visit the Truhlsen-Marmor Museum of the Eye at 655 Beach St. in San Francisco starting in 2020!



What We're Reading This Fall 2019

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@ao.org.

Bad Blood: Secrets and Lies in a Silicon Valley Startup

By John Carreyrou

Reviewed by Samuel Masket, MD

From the outset, we learn that the chief character, Elizabeth Holmes, a 20-something Stanford dropout was obsessed with money.

As a child of privilege and promise, at her seventh birthday she was asked if she hoped to be an astronaut. Eschewing that career path, she said: "No, I want to be a billionaire." That response presaged her path. She left college after one year to pursue her dream and to "conquer" Silicon Valley. She idolized Apple CEO Steve Jobs and eventually adopted his style of dress and manner of speaking.

Holmes' plan was to develop a new device for clinical blood testing that would revolutionize the process. She envisioned and designed a machine that could rely on only a few drops of blood (from a fingerstick) to analyze hundreds of parameters. Combining the words therapy and diagnosis, she named the company Theranos. She recognized that the pharmaceutical industry could use such a device to help speed new drugs through the approval process,

and she helped capitalize the project early on by getting advances from GlaxoSmithKline and Pfizer.

Holmes did her own public relations and marketing and was able to use contacts, guile and charm to assemble a board of directors of notables, including George Schultz and Henry Kissinger. And she was able to raise investment funds from Rupert Murdoch, Betsy DeVos and Robert Kraft, among others. Safeway and Walgreens were convinced to build mini-labs in selected stores using her services. All of that said, the project was a total falsehood, likely from the beginning, and it became all too apparent that the she could not create the device that she sought and promoted. Holmes hid that information from clients, investors, etc. She became very secretive in her business practices, and she isolated herself from staff, fired employees and threatened her detractors. She hired and used the bullying lawyer, David Boies, to fend off and intimidate those who sought to investigate and expose her ruse.

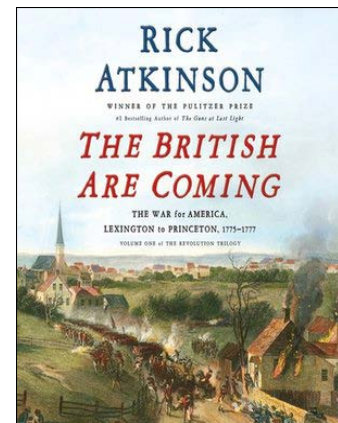
Ultimately, the author, John Carreyrou, then a reporter for The Wall Street Journal, launched an investigation after he became aware of the concerns around Theranos. Against pressure and threats, Carreyrou was able to uncloak the malfeasance and wrote a nail-biting account of the deceptions and fraud enveloping Holmes and Theranos. The book is a most fascinating read and, for me, was a genuine page-turner.

The British Are Coming: The War for America, Lexington to Princeton 1775-1777 (The Revolution Trilogy)

By Rick Atkinson

Reviewed by J. Kemper Campbell, MD

"The British Are Coming" is the first volume of Rick Atkinson's Revolutionary Trilogy, destined to become a definitive account of the



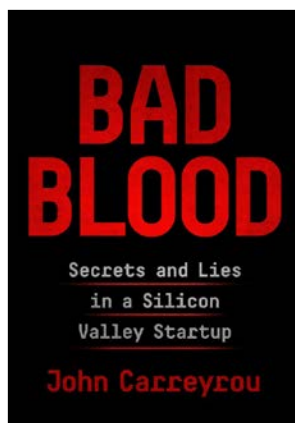
eight-year civil war known as the American War of Independence.

The author's prodigious research included special access to King George III's recently available personal papers. Atkinson's attention to detail has already established his reputation as one of America's foremost popular historians. In 2002, Atkinson began his Liberation Trilogy with "An Army at Dawn" which won the Pulitzer Prize. The final volume of the trilogy, "The Guns at Last Light," was not published until 2013, and completed his acclaimed history of the United States' role in the liberation of Europe and defeat of Nazi Germany in WWII.

Now the author turns his attention to the American Revolution and shows that his exquisite skills as a writer and dramatic narrator have not waned.

The sights and sounds of 18th century London, Paris, Boston and New York become familiar to readers of this initial volume. Rather than the two-dimensional heroes and villains portrayed to students in elementary school, the multifaceted characters of George Washington, Ben Franklin, Benedict Arnold, and King George III and his red-coated minions are brought to vivid life. The smell of blood and gunpowder and the chill wind as Washington crosses the Delaware are palpable in Atkinson's prose.

"The British Are Coming" only deals with the first two years



What We're Reading

of the conflict and ends when Washington's tattered soldiers make his famous Christmas Eve attack across the frozen river.

Canada is won and lost by American troops in this volume, France is not yet involved, and the outcome of the war is certainly in doubt at the book's end. However, the inevitability of England's ultimate loss of its colony is portended as the difficulty of managing the 3,000-mile separation of the protagonists becomes obvious.

This book draws readers into a world and time which permanently changed the course of history and formed the new and unique nation which became the United States. Those who open this volume must now patiently await the next installment.

The Soul of America: The Battle for Our Better Angels

By Jon Meacham

Reviewed by M. Bruce Shields, MD

The current climate of partisan discord in our country seems to be spawning books that attempt to make sense of it and offer hopeful answers. In the Book Review section of the winter 2019 issue of *Scope*, we reviewed one such book by Doris Kearns Goodwin, "Leadership in Turbulent Times," which recounts how four U.S. presidents – Abraham Lincoln, Theodore Roosevelt, Franklin D. Roosevelt and Lyndon

B. Johnson – and our country, rose to challenging times and left the country better than they found it.

Another book in this genre is "The Soul of America: The Battle for Our Better Angels," by the Pulitzer Prize-winning biographer Jon Meacham. Like Goodwin, he encapsulates the history of several American presidents, as well as citizen activists such as Martin Luther King Jr., Rosa Parks and Eleanor Roosevelt, to remind us that our country has come through many dark times in the past and always seems to be sustained by what Lincoln called "the better angels of our nature" and to find a way to prevail.

Meacham covers a wide swath of American history from the Civil War to Johnson's crusade against Jim Crow laws. It is a reminder that race relations, the backlash against immigrants and the fight for women's rights are among the key issues that our country has been facing with varying emphasis since the birth of our nation. It is also a reminder that dealing with them during especially challenging times throughout the course of our history has demonstrated the resilience of our society and our ability to rise above partisan fury and to find a better way.

How to Change Your Mind

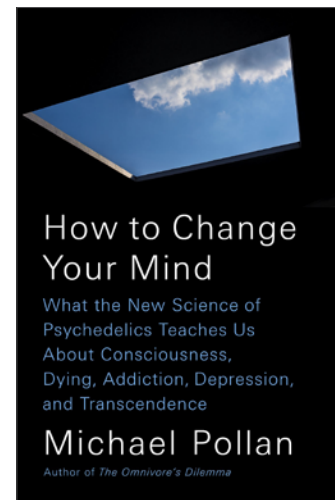
By Michael Pollan

Reviewed by Thomas S. Harbin, MD, MBA

Turn on, tune in, drop out!

Admit it, we all knew that phrase although, of course, we never parroted. Well, psychedelics are back. The full title of Michael Pollan's book says it all: ***How to Change Your Mind: What the New Science of Psychedelics Teaches Us About Consciousness, Dying, Addiction, Depression, and Transcendence.***

Timothy Leary's flamboyant enthusiasm of LSD helped lead to a ban on all psychedelics in the early 1960's. At that time, there were almost 1,000 trials involving



40,000 participants studying the effects of LSD on alcoholism, schizophrenia and other mental disorders and end-of-life experiences. All were halted when Sandoz stopped supplying the drug.

The new era of psychedelics began in 2006, and now there are multiple studies looking at the effects of either psilocybin or LSD on addiction, depression and end-of-life problems. Several cities have decriminalized these substances. Favorable anecdotes abound and psychedelic-assisted psychotherapy is spreading.

This book very thoroughly covers the history and current status of psychedelics and provides an interesting introduction to a topic you will be hearing more about.

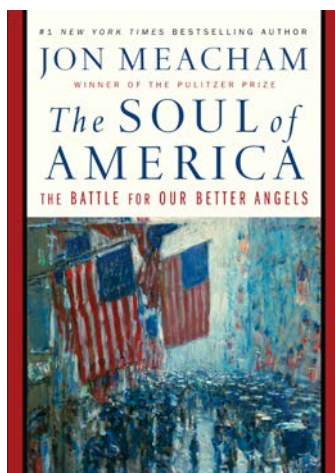
The Library Book

By Susan Orlean

Reviewed by John R. Stechschulte, MD

"The Library Book" is much more than a book about books. It is the story of a huge fire that destroyed the Los Angeles Public Library on April 29, 1986.

While the world's attention was focused instead on the Chernobyl nuclear plant meltdown that led to fears that we were witnessing the end of the world, the Central Library burned for seven hours. Author Susan Orlean explains how the library fire investigation was altered over



What We're Reading

the years as arson and fire scientific principles were found to be very unreliable, which also led to major changes in criminal prosecutions of suspected and guilty arsonists across the country. You'll need to read the book in order to learn the outcome of the case against actor and suspect Harry Peak. "The Library Book" also describes an interesting cast of former librarians who have grown libraries from humble metropolitan charitable initiatives into today's crucial social institutions. It shows the shift from a once male-dominated profession to its current superb female leadership.

Orlean, a master journalist, shows how the immense value of libraries has been recognized throughout history. Their power was problematic to leaders like Chinese emperor Qin Shi Huang, Adolph Hitler, the Khmer Rouge and the Iraqi army while in Kuwait, who burned libraries and books. As the author states, "War has been the greatest slayer of libraries."

Finally, this book brings back fond childhood memories of visiting community libraries with family. It also illustrates their tremendous evolution into modern treasures. Libraries will always play essential and many times unique roles in American life while serving as cornerstones of the national identity.

The Assault on Intelligence: American National Security in an Age of Lies

By Michael V. Hayden

Reviewed by Marcia D. Carney, MD

"The Assault on Intelligence: American National Security in an Age of Lies" by Michael V. Hayden is probably going to be known for its well woven historical perspective. However, the poor appreciation for the United States president is the book's echo.

Gen. Michael Hayden, former head of the CIA and national intelligence with seven decades of experience, initially gives good former intelligence history of when the world was "truly dangerous" as he describes,

such as during the Cuban Missile Crisis and armor standoffs at the old Checkpoint Charlie in Berlin, to nuclear alerts in 1973 with the Soviets threatening intervention as their Arab allies were collapsing. The author describes this history as a "dangerous past." However, he is quick to weigh in on what he considers faux pas of current U.S. President Trump, a totally different recent past.

Things in the world now are more interconnected, Hayden concedes, even more dangerous, as he describes, "one such tectonic is the rise of substrate actors – groups, gangs, even individuals – who can visit the kind of destructive effects on our society that we used to associate only with malevolent state power." He voices the increased strengths of community crimes, transnational crimes, terrorism related to the "empowerment and connectedness of the post-industrial world." All truisms. Although most of the world sees China as a country rising to power, China is quick to point out that this is not the case, according to Hayden. China sees its position in the world as a restoration to power, implying that Chinese power was present prior to any power of the United States.

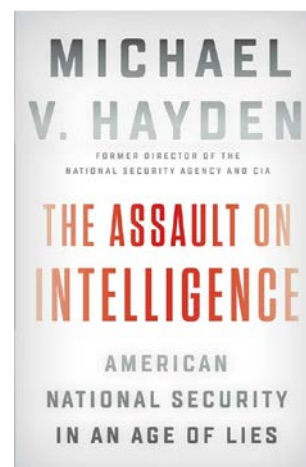
For me it was somewhat of a difficult read, and I did not expect that. I had to go back to find the reason for the book. Every line is filled with history of our nation in relation to other nations (when I was probably studying for some ophthalmology presentation and teaching the importance of ophthalmology).

However, in reference to a "seasoned panel convened in early 2016 (during the presidential election)," Hayden was meeting with a panel on global security questions in front of the Republican caucus from both the House and the Senate, and my questions were answered. A panel was convened which set the stage. The description of the setting created such clarity for the rest of the book (though still a difficult read).

"Look! What's going on here is the melting down of the post-World War II, American liberal, Bretton Woods, World Bank, IMF world order. Kagan pointed out that the world had enjoyed three-quarters of a century of relative peace and prosperity shaped by Americans." The America-centered global structure has changed dramatically, leaving the question: What role does America see for itself in creating and sustaining world order 2.0?

Previously America had placed global interests before its own, its narrowly defined national interests, all of which were being challenged by President Trump. Although our American community (Trump?) wanted to hold on to America and not globalism," Hayden forecasts the direction of America under President Trump.

"On Feb. 16, 2018, Rod Rosenstein in the Dept. of Justice auditorium announced to the press, to the world and to Vladimir Putin that the USA was indicting 13 Russian nationals and three Russian companies for committing federal crimes while seeking to interfere in the U.S. political system, including the 2016 presidential election." And for Hayden, the story continued. Russia interfered in the 2016 election and 2018 elections. According to Hayden, American Intelligence remains steadfast on this issue. The book ends in threatening tones. What happens next, phase four, with the president and the intelligence community. The next book?



Blue Angels: A San Francisco Treat

Susan H. Day, MD

As AAO 2019 approaches, consider this both an invitation as well as a “heads up” notification: The Blue Angels will be flying overhead during our meeting.

San Francisco Fleet Week, scheduled this year for Oct. 6 to 14, features the Blue Angels, entertaining big crowds and creating massive traffic jams. This year, our annual meeting has one additional attraction! While you are here, you and your guests will delight in the Blue Angels shows. The sky’s literally the limit!

The Blue Angels are one of the world’s premier flight demonstration squadrons, serving a specific mission “to showcase the pride and professionalism of the United States Navy and Marine Corps by inspiring a culture of excellence and service to country through flight demonstrations and community outreach.” In San Francisco, the Blue Angels attract more than a million spectators. Across the country, their shows run from March through October.

Created in 1946, the squadron once featured propeller plane F6F Hellcats. These days, six F/A Hornets fill the sky at speeds of up to 700 mph and at decibel levels that

are envied even by Harley Davidson owners. The only modifications from the combat-ready models are the iconic blue and yellow paint job and replacing weapons with a tank for decorative smoke oil.

Fortunately, the repertoire for this precision team can accommodate even the unpredictable Bay Area fog, with choreographed and well-rehearsed “high,” “low” and “flat” shows. Shows in San Francisco are particularly impressive, with the bay providing the location for stunts and the hills providing ample viewing venues.

How will this impact you during your visit?

- Practice sessions will be held Thursday and Friday afternoons. Start times may vary. The roar of the jets will let you know when they start. Practice sessions are terrific for viewing, because the crowds get exponentially bigger for expanded activities on Saturday and Sunday.
- Streets in prime viewing areas along the waterfront are jam-packed on Saturday and Sunday. This will be a major issue for those

of you staying near Fisherman’s Wharf. The most efficient travel mode will be walking, as shuttles will not have any special access.

- Although the location for the event is officially listed as the Marina Green, the entire northern waterfront of San Francisco is really best for viewing. By all means, if you have access to a boat, that surely would be even better! Note, if you captain the boat, there are specific channels where no boat traffic is allowed.
- Finally, there are other entertainment options for you this week. On Sunday, the annual Columbus Day parade occurs in North Beach. Where Mardi Gras parades offer doubloons as “throws,” this parade features garlic candy. Columbus and Stockton Streets are blocked off, creating more traffic snarls. The activity centered around Washington Square includes ample opportunity to feast on Italian treats.

Sadly, the likelihood of the San Francisco Giants playing in the World Series is about as remote as an opportunity for you to take a ride with the Blue Angels!

And, of course, the best activities will be in Moscone Convention Center!

The Blue Angels fly in formation over the Golden Gate Bridge.



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Artificial Intelligence: What Does It Mean for Our Future?

Alfredo A. Sadun, MD, PhD

My interest in Artificial Intelligence (AI) began as an undergraduate in the late 1960s. There, at MIT, I had an amazing lecturer on the subject, Marvin Minsky, who is regarded as one of the three great fathers of AI (see photographs).

For 40 years, there was little progress in the field, except that the concept that has been exploited by well-known movies (“2001: A Space Odyssey,” “Ex Machina,” “The Matrix,” etc.). About 10 years ago, some of my ex-fellows and colleagues and I proposed a project, which we published, using machine learning (a subset of AI) to test out my standard teaching paradigm that involved 10 signs of disc edema.

A total of 122 patients with disc edema were hospitalized for a battery of tests, including MRI and lumbar puncture, leading to a final determination of papilledema vs. pseudo papilledema. Such a project was only possible in a country like Italy, where state sponsored socialized medicine covered the costs. It turns out that only four (e.g. swelling of the retinal nerve fiber layer) of the 10 signs were critical. I was impressed that AI could objectively evaluate and rank the importance of each sign of disc edema. I was also impressed that off-the-shelf software could now be tweaked for an AI algorithm that we could actually use for this study. In short, the revolution had finally come.

What is AI?

The movies get it a little right, but mostly they get AI wrong. The movies exaggerate the robotics part and miss the AI learning part. AI can mean many things. I will use, in this essay, the specific concept of machine learning by

neural networks. In this way, a machine learns, not from a logical algorithm, but from its experience.

Such machine learning can use neural networks for “unsupervised training” for general AI. A neural network can have many hidden layers and thus be remarkably complicated. It can have feedback, recurrent, feedforward and other types of loops. In essence, the strength of each connectivity is enhanced by the training set of experience.

Thus, it continually maximizes its chances of interpreting inputs usefully. This is akin to positive reinforcement (as when a Pavlovian dog whose hearing is enhanced to the ringing of bells anticipates food) and negative reinforcement that can convey a negative relationship (as when a child touches a hot stove), but at a very deep level that is essentially “a black box.”

Accordingly, machine learning is not that different from animals and children who use their neural network (brains) for learning. However, it’s fundamentally different from adults sitting in a classroom with pencils and pads who apply logic and formulas and, ironically, it is the opposite of a human written computer program.

AI needs input. Lots of input, provided in large training sets. Since AI relies so heavily on having huge amounts

of data, it works quite well with images that can convey a lot of information. It is the opposite of deductive reasoning and thus must depend on massive amounts of good data to be accurate.

Minsky often lectured that we had to be careful about suitcase words. A suitcase word carries a variety of meanings packed into it. When you use the words, “intelligence,” “learning,” or “understanding,” you probably mean different things at different times. If we have a discussion using these words, we might assume we understand each other, when we really do not. When dealing with AI, it is better to use words like “recognize,” “identify” or “predict.” These are clearer terms that are more invariant, and they can be readily quantified.

AI can be trained to recognize a cat from a dog by simply exposing the neural network to hundreds of thousands of images of cats and dogs. It then will correctly identify new images of cats and dogs even if some of the images have hidden elements, like tails and legs, or are of different sizes or perspectives or just sketches and cartoons. In the end, it is much like my 4-year-old

Marvin Minsky, one of the fathers of artificial intelligence



Artificial Intelligence

granddaughter who uses pattern recognition to correctly classify an image of a cat or dog, but can't explain to me how she does it.

What AI is Not

I like to tease my non-ophthalmology physician colleagues at lunch by asking them a version of, "What will you do when AI comes for you?" Their answers are unsettling as they reflect two things: 1) A profound lack of understanding of what AI is, and, 2) a prejudice that comes from their recent bad experiences with computers in the form of electronic medical records (EMR).

Most of my physician friends think that AI means powerful computers. What they know of fast computers is usually in the form of recently acquired computer interfacing for EMR. They see that the computer interface prompts them with lots of questions, which they find both intrusive and frustrating since often these questions are for regulatory and billing issues. The computer prompts often do not advance the cause of diagnosis or patient management. My physician friends see the computers as more of an obstacle to patient care though a boon to maximized billing. The "intelligence" they see in the computer, is in its comprehensiveness; it does not miss a trick for maximal billing. They do not appreciate the difference, in kind, of what AI can do.

Then I hear this common answer: "Computers won't replace me", each says, "because AI can't capture all the nuances of the diagnostic process." Alternatively, they say, "Computers can't administer the kindness and compassion that we, human doctors, provide." They are thinking how EMR gets between the physician and his/her patients. And that's true, as I have had to remind my residents and fellows to look up from the computer

and make eye contact with our patients; but this has nothing to do with the limits of AI. This impediment can be easily bypassed by the application of systems that are more sophisticated or non-physician human contact.

So, AI is not a better EMR. It is not a robot. It is not a fast computer that was programmed by a smart software engineer who was taking advice from a physician at his side who was explaining how to make a differential diagnosis. General AI is completely different. It is autonomous. It feeds on data. And it keeps getting better, by itself.

Examples of What AI Can Do.

A recent project you may have heard of, as it's ophthalmological, was done in concert with Google. Ophthalmologists were asked, "Is there a difference in the appearance of a healthy retina between men and women?" We all said, "No."

Then hundreds of thousands of images of the back of the eye were provided to image-analyzing computers together with the notation as to which were from men and which from women. This was used as a "training set." Using a neural network system of learning, the AI system was asked to predict whether new images were from men or women. After several iterations, it got really good at that. So now, AI could do what humans could never do, and do it with up to 97% accuracy!

How did AI do this? We don't know. The problem is that we can't just ask the computer what it was thinking. We can't dissect and examine the AI process because there was no underlying logic. But there are ways to "interrogate" the "black box." This can be done by masking portions of the fundus image. The AI did well when the mask blocked out various parts of the retina except for those involving the fovea. From this, we know that

something about the appearance of the fovea was critical and necessary.

Remarkably, ophthalmologists, even knowing that the gender difference was in the fovea, still do not see any differences between the retinas from men and women. This is both frustrating and amazing. It's frustrating, since this AI research has not really revealed new scientific truths about gender and foveas. It's amazing, since for the first time, computers, can do what no ophthalmologist on earth can do by accurately identifying gender from retinal images alone. Imagine what else is hidden from our view, but available for AI to recognize.

Why This Is Fundamentally Different, in Kind as Well as Speed

Sam Harris has a wonderful TED talk titled, "Can we build AI without losing control over it?" Of his many good points, the core one is this. The speed of AI is a game changer by itself. This is partly because AI builds itself. To have a system a little faster than the other AI systems means that soon it is much faster than the competitors are. This concept has not been lost on industry or nations. It has been estimated that whoever takes the lead will leapfrog beyond the others, and not by a little.

Electronic circuits work about 1 million times faster than human circuits. So, an AI system just as smart as very good scientists, might, in a few days, make the same progress as the best scientists at Stanford and MIT could make in 20,000 years. AI will soon be changing the game in extremely short periods, with no time to make human-friendly adjustments, unless these too were built into the AI.

However, there is another fundamental difference between AI and how humans have been making progress in the last 10,000 years. AI is unconstrained by logical paradigms. It's not even fuzzy

Artificial Intelligence

logic, it's just completely results driven. This is faster, more powerful, and less predictable, than logic. And less accountable as well.

What This Means to Ophthalmology

We will be at the forefront. Already deep learning techniques of AI have demonstrated that fundus photographs can be used to estimate HbA1c values (+/- .35%). We do not know how, but it's not the blood vessels. AI can be used on fundus photographs to estimate the patient's age (more likely their biological age).

In Singapore (see works of Ting, Wong and Milea), where the state owns the fundus photographs of most patients, this can be used to predict, with remarkable accuracy, who will be having strokes and heart attacks in the subsequent year. Likely, the eye is just a convenient access point to visualizing the human circulation in vivo. I think we are only a couple of years from anticipating stroke, and neurodegenerative diseases through fundus photographs or OCT.

Of course, we are now capable of using such AI technology to follow age related macular degeneration, glaucoma and other optic neuropathies for grading disease as well as for screening. Moreover, the grading will become the basis of Food and Drug Administration-approved new treatments and we, as ophthalmologists, accepting new treatment protocols. As we ophthalmologists acquire so many high resolution and data rich images, we may be at the lead with AI in medicine. As it is, most of our great imaging data now just goes to waste.

What This Means to Medicine

This major revolution is coming to medicine and healthcare. In addition to image analysis,



Fathers of artificial intelligence: Norbert Wiener and John von Neumann.

medicine will use the rich data sets available through EMR and consortiums such as the Academy's IRIS® Registry and medical records shared by large universities and integrated health care systems such as Kaiser Permanente.

AI will be the standard for screening, diagnosis, prediction and monitoring of disease progress against management strategies (including a comparison of providers). With large data sets, AI will correctly put people into bins based not on clinical diagnosis, but based on unexpected features that identifies those most likely to benefit from specific therapies. This is entirely different from what doctors presently do. There will be less understanding, less insight, less logic, less teaching, and less elegance.

Nevertheless, AI is likely to be more effective, more encompassing and certainly faster and more efficient, at managing most patients. The first medical fields to go will probably be those that rely most on data-rich images (likely order: radiology, dermatology, pathology and ophthalmology). My personal teaching style has always emphasized the careful observation of signs and symptoms to set up a hypothesis that can be tested with clever questions and physical testing, as a cornerstone of neuro-ophthalmology. It will soon become obsolete and will

lose out to AI pattern recognition, at least for common disorders.

What AI Means to Society

Science fiction is about to become reality. "Computers are like humans, they do everything except think"; John von Neumann, 1956. Intelligence has always driven change. Artificial intelligence will drive change faster than we can imagine. It is silly to say that the machines will be "smarter than we are."

"Smart" is a suitcase word. But for sure, they will be much, much faster, more competent and with broader horizons. It is humanly impossible, to anticipate where this will be going. The industrial revolution changed our society, our world and our lives, in profound ways. The economic and political order changed dramatically in about two hundred years. AI will do the same, in much less time. Buckle your seat belts.

On the other hand, AI can solve problems that humans cannot and, in many cases, problems that we do not even think are solvable. Creativity is intelligence applied in unexpected directions, and we should not be surprised when AI identifies as well as solves crises. Our planet is facing some serious challenges, and AI may be the thing that can save us. We might as well try and be part of this solution.

Foundation Update

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

AAO 2019 is upon us, and I am looking forward to seeing all of you in San Francisco, Oct. 12-15! The Foundation will have a desk in the Academy Resource Center, West, Booth 7337. Stop by to speak with our staff about the new Truhlsen-Marmor Museum of the Eye™ fundraising campaign. If you are an EyeCare America® volunteer, please plan to pick up a special thank you gift.

Score Some Great Deals in the Orbital Gala Auction

A big thank you to those who purchased tickets for the 16th annual Orbital Gala! The Hollywood-themed fundraiser takes place on Sunday, Oct. 13 at the Palace Hotel in San Francisco. Tickets for this year's gala are sold out.

If you cannot attend the Orbital Gala this year, you can still bid on items online. The auction opened to all U.S. members on Oct. 4, and



Bid on an Optos California icg Ultra-Widefield Retinal Imaging System at the Orbital Gala fundraiser.

bidding is easy and fun on our mobile app. You can register to bid at aao.org/foundation and get great deals on one-of-a-kind silent auction items, like a four-night stay and fly-fishing trip at Utah's Teton Valley Lodge, a four-night stay at Porto Elounda Golf Spa in Greece, an Optos California icg Ultra-Widefield Retinal Imaging System, an Iridex Cyclo G6™



Bid on a four-night stay and fly-fishing trip at Utah's Teton Valley Lodge at the Orbital Gala fundraiser.

Glaucoma Laser System, an autographed Golden State Warriors basketball, Marion Parke and St. John gift certificates, and much more. [View a full list of items.](#)

Honoring Bruce E. Spivey, MD, MS, MEd

At the 2019 Orbital Gala we are excited to honor our beloved friend and colleague, Dr. Bruce E. Spivey.

With energy, vision and leadership, Dr. Spivey has grown and strengthened many institutions, including the Academy, the International Council of Ophthalmology, Pacific Vision Foundation, Council of Medical Specialty Societies, Columbia-Cornell Care and others. What is the secret to his success? "I never learned to say no. It is all interesting and all a challenge," he said.

Dr. Spivey plans to continue to say yes to endeavors that enhance the profession. "We must constantly work toward improving ophthalmology education," he said.

A stunning view of stunning Porto Elounda Golf Spa in Greece, where bids will be open for a four-night stay.





Dr. Bruce E. Spivey, courtesy of the Truhlsen-Marmor Museum of the Eye archive collection.

“There is always more to do and learn, given continual improvements in science and education.”

Although the Orbital Gala is sold out and the tribute book has been printed, you can still make a gift in honor of Dr. Spivey at aao.org/foundation, or at the Foundation desk in the Academy Resource Center, West, Booth 7337.

Remember the Foundation on Giving Tuesday and at Year-End

What Academy programs have you most enjoyed? To whom in your life would you like to pay tribute? On Giving Tuesday, Dec. 3, and at year-end, you can express your appreciation with a gift to the Academy Foundation. Consider supporting Academy programs such as the Ophthalmic

News and Education (ONE®) Network, the IRIS® Registry (Intelligent Research in Sight), EyeCare America, global outreach and the Museum of the Eye campaign. Your tax-deductible gift can be made in honor or memory of someone special. To donate, visit aao.org/foundation/giving-options.

Join the 1896 Legacy Society

Whether you are currently practicing or enjoying retirement, it is the right time to consider your legacy and explore meaningful ways to give back to your profession. One way to do this is through the 1896 Legacy Society.

Named for the Academy's founding year, the 1896 Legacy Society is comprised of donors who have included the Academy Foundation in their estate plans.

What are the benefits? By including the Academy Foundation in your will or trust, you support the Academy's education initiatives for ophthalmologists and help prevent blindness worldwide. Through your legacy, future generations of ophthalmologists will be better positioned to succeed and create lasting legacies of their own. Plus, you and your loved ones may reap significant tax benefits. To get started, visit aao.planmylegacy.org.

To those of you attending AAO 2019, safe travels! And as always, feel free to contact me any time at gskuta@aao.org.

SCOPE

The Senior Ophthalmologist Newsletter

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