



SCOPE

David Cogan in Hiroshima—1949

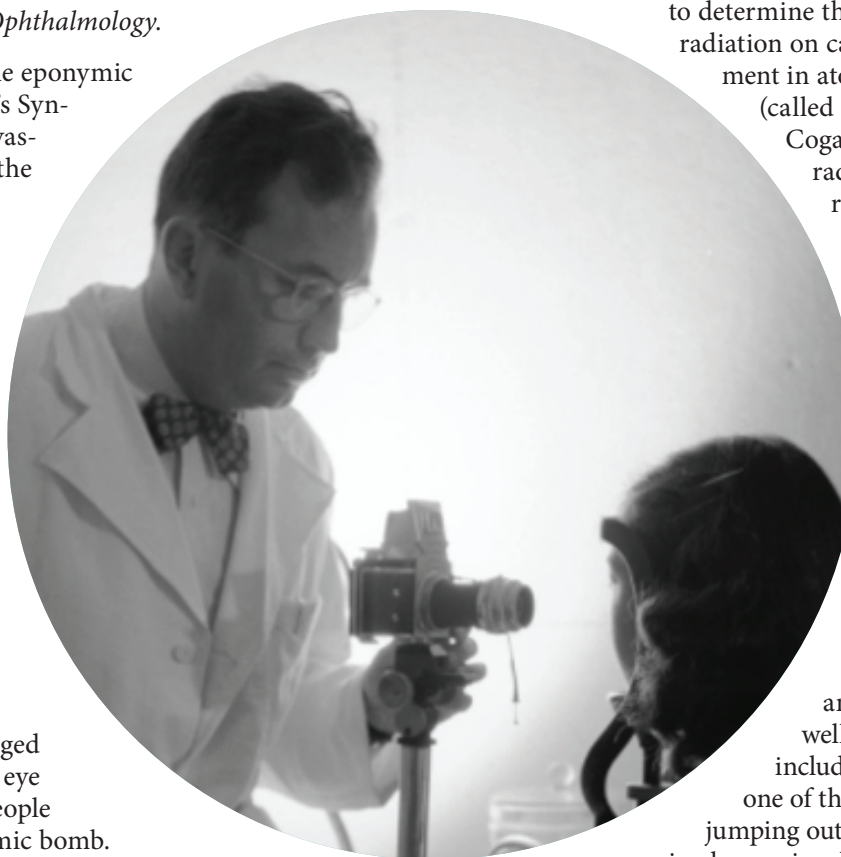
By R. Nick Hogan, MD, PhD

Most ophthalmologists know of David Cogan, MD — past director of the Howe Laboratory at Harvard, ex-chairman of Harvard's ophthalmology department and former chief editor of the *Archives of Ophthalmology*.

He's known as the eponymic principal of Cogan's Syndrome, Cogan's Myasthenic Lid Twitch, the Cogan-Reese Iris Nevus Syndrome, Cogan's Oculomotor Apraxia, Cogan's Calcific Scleral Patch, and Cogan's Microcystic Corneal Dystrophy. Additionally, many ophthalmologists know David Cogan as the leader of a medical group that traveled to Japan in 1949, charged with elucidation of eye abnormalities in people exposed to the atomic bomb.

However, new and interesting material has been uncovered regarding Dr. Cogan's Japan trip. David's diary on the journey, contained in documents and photographs, were recently donated to the Massachusetts Eye and Ear Infirmary Howe Library by his daughter,

Priscilla Cogan. This collection provides detailed insight into the clinical hurdles Cogan faced as well as his reflections on Japan and its peoples at a very unique time



Dr. David Cogan photographing eye of unknown atomic bomb survivor.

in history. I am honored to be the first person outside of Cogan's family and the archivists, to view this

material and the story offered below is derived from those records. All of the following quotations are from Dr. Cogan's personal journal.

Dr. Cogan traveled to Japan in 1949 at the invitation of the Atomic Bomb Casualty Commission, a subgroup of the Atomic Energy Commission. His group was tasked to determine the effects of atomic radiation on cataract development in atomic blast survivors (called Hibakusha). Dr.

Cogan had experience in radiation induced cataracts through his previous investigations of lens changes in cyclotron workers and was a logical choice.

The group arrived in Tokyo on September 5, 1949, then traveled overnight by military train to Kyoto and then Hiroshima. "It was frightfully hot and none of us slept well. Our compartment included two GIs, and one of them went berserk, jumping out of his berth claiming he was in a barber shop. I spent the rest of the night reading."

Dr. Cogan arrived in Hiroshima on September 7, 1949. On viewing the destructed landscape, fractionally rebuilt, he said, "I felt I had been transported to another world." He went right to work.

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“It so happened that the afternoon of our arrival at Hiroshima, a research council meeting was taking place, the subject of which was us and our plan of attack,” he wrote.

It immediately became clear to Dr. Cogan that there was a difference of opinion as to study approach. In order to get a random sample, the council’s epidemiologists planned to study only those survivors who lived at defined distances from the blast hypocenter — designated as the atomic commission’s survey population. This would mean only two to three people per day would be available for examination, with unclear exposure history.

Dr. Cogan’s plan was to examine as many people as possible regardless of their residence location, thereby increasing the chance of finding pathology. “Discussions are to be pursued further tomorrow, but I am going to hold firm,” he said. “We’re making general nuisances of ourselves and may get somewhere yet.” Dr. Cogan’s plan was adopted.

At the time of Dr. Cogan’s visit, Hiroshima had already been partially reconstructed. “There is surprisingly little evidence of the A-bomb damage,” he wrote. Yet there was still graphic evidence of the effects of the bomb that had exploded 1,500 meters above Hiroshima on August 6, 1945, four years previously. “About 1,000 meters from the hypocenter is a graveyard and a flying stone is embedded into the top of a tombstone, evidently projected by the A-bomb blast,” he noted. “On a gas tank about 2,000 meters from the hypocenter is what may look like a shadow in my pictures, but it is believed to have been the area protected by a human figure” outlined by infrared radiation.



Dr. Cogan’s “Ophthalmology Team”. Dr. David Cogan (left rear) and Dr. Samuel Kimura (right rear) with 3 of the clinic interpreters.

The space to be utilized as an eye clinic was in the auditorium area of what had been the Japanese army headquarters building, one of the few buildings to survive the bomb. The atomic commission’s headquarters “is located not less than 1,500 meters from the hypocenter and was within the fire-razed area, yet none of it gives the least evidence of destruction.” It was adjacent to the harbor and marked the embarkation point for soldiers and sailors going to war. It was here they would swear their allegiance, and their lives, to the emperor, who on assump-

tion of the throne had named himself the “Showa” emperor, meaning “radiant peace.” Dr. Cogan commented, “It is somewhat ironic that peace would come to this land only through the use of radiant energy.”

Renovations to the space for the “eye clinic” were completed and equipment ready to go on September 12, 1949. “There are two examining rooms each with slit lamps. A perimeter is in one room and my photographic set-up in the other”. “Three (additional) cubicles are for visual acuity testing and history taking by the interns,” with

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the help of “splendid” bilingual interpreters. Prior to the opening of the clinic, Cogan examined a 22-year-old waitress from the atomic commission cafeteria “who had failing vision for eight months. She was in a streetcar 500 to 1,000 meters from the hypocenter.

“Her face was burned, but her body was shielded by people around her (and the streetcar). Beginning two weeks after the A-bomb all her hair fell out, and she was bald for one year. Her vision was, however, normal (measured 20/20 OU) up to eight months ago but has progressively degraded since then.” It was determined that she had cataracts as the cause of her vision loss and that they were of the type compatible with those induced by radiation. The patient, “Hatsue Kimura was then our first discovery of a positive eye effect of atomic radiation.”

The type of cataract the ophthalmology team was looking for consisted of disk-shaped opacities “in the axial zone of the posterior lens capsule over an area of 2 to 4 mm, with occasional punctate dots farther toward the periphery. The central opaque disks had jagged but relatively sharp edges.” In more marked cases peripheral changes were denser than the central changes, forming a doughnut-shaped opacity. They usually contained polychromatic crystals. These changes are not pathognomonic of radiation cataracts and are found to varying degrees in other types of cataracts. However, if this type of lenticular change was bilaterally symmetrical and occurred in a relatively young person with a history of radiation exposure, etiology due to radiation was considered highly likely. Dr. Cogan wrote, “These cataracts are similar to those which have previously been associated with exposure to x-rays and gamma rays.”

September 13, 1949 was the first day patients were seen in the



Ophthalmology group in an examining room at ABCC eye clinic. Standing (left), Dr. Samuel Kimura, (right), Dr. David Cogan. At slit lamp, unknown patient and Dr. S. Forrest Martin.

eye clinic. “Thirty cases from the [commission] survey were examined, and five cases were transported in by Dr. Hiroshi Ikui [the chief local ophthalmologist]. Two additional cases of radiation cataracts were found, total being three at this time.” By the second day, unsolicited patients were also coming for free diagnosis. The newspapers had announced the arrival of Dr. Cogan and his colleagues, and it was hoped this advertising would produce additional candidate patients. By the second week of operations, fifty patients a day were being examined. However, Dr. Cogan was disappointed to find that although these all are listed as having been in the “open” at the time of the bomb, many of them were shielded by buildings, trees or other persons, etc., “so

that the amount of radiation which they received is greatly variable.”

The eye group was functioning six days per week, but Dr. Cogan took Sunday off and went to a shrine island called Miyajima, about 40 miles up the coast from Hiroshima, then took a 30-minute ferry run from the mainland.

“Miyajima is famous for its Shinto Shrine with a Torii [a gate symbolizing transition from the mundane to the sacred], the oldest in Japan, about 60 feet out in the water.” Miyajima Shrine (Itsukushima) “is a place where one is not supposed to go with one’s wife until after being married for seven years lest it make the Sun Goddess jealous. The implication is that the romance of marriage lasts no more than

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seven years,” he wrote. Dr. Cogan thought the island was beautiful and enjoyed his visit. But on leaving the island, he wrote “There was a large number of drunk Japanese on the island — I have not seen natives drunk elsewhere.”

As Dr. Cogan’s stay in Japan lengthened, he became familiar, by frequency of contact, with several Japanese characters: “The symbol for ‘men’ looks to me like a person running in a big hurry. I’ve been told on unquestionable authority that a certain character, used singly, means ‘women’, but when repeated means ‘quarrelsome’ and when repeated twice means ‘noisy.’ I don’t know what repetition of the symbol for ‘men’ might mean.”

On Monday September 26, 1949, Dr. Cogan traveled to Nagasaki. “A lifetime has passed in the past few days! Rarely have I had such a concentration of thrills as have occurred since writing the previous



Oct 30, 1949
This patient is still
in the hospital at Red
Cross Hospital where he
has been since the
Atomic Bomb explosion

Nagasaki atomic bomb survivor with extensive keloid formation after thermal burns.



Ruins of Nagasaki Medical College one day after the atomic bomb explosion. (REUTERS/Torahiko Ogawa/Handout/Issei Kato)

note and now that I sit down and try to recapitulate the events, my head is in a whirl.” Apparently, Dr. Cogan was to have given a lecture to the Kyushu Ophthalmological Society but met with some difficulties. Because of translation issues, he had planned a purely slide oriented talk. He was told a projector would be available but this “turned out not to be the case (typical!).” Dr. Cogan contacted civil affairs which had 34 projectors, all apparently on loan to various Japanese educational organizations. And because the day was an autumn holiday none were immediately available. Finally, one was found about an hour’s drive from the city. “It arrived just five minutes before my lecture, but when I turned it on, I found there was a short circuit that could not be repaired in time. Therefore, I gave an impromptu talk with the aid of an interpreter and a blackboard.”

While in Nagasaki, Dr. Cogan visited patients in the Red Cross Hospital and the partially rebuilt Nagasaki University Hospital. “The cement ruins of the former Nagasaki Medical College Hospital were

noteworthy”. The college was less than 1 kilometer from the hypocenter. The walls that remained “showed some profile burns, blast in-bowing, and silhouette splattering by fine glass particles. Many bottles had been fused and distorted. Outside were several markers still standing where they had been placed to identify persons killed — placed before the mass cremation.” The Medical Commission Report stated 600 of the 800 medical students and 12 of the 16 professors were killed.

Dr. Cogan met with several ophthalmologists in Nagasaki and discussed his interest in finding radiation cataracts, “I found them exasperatingly evasive but willing to call in a patient of Hirose’s (Ikui) who was said to have radiation cataracts. They had not seen or heard of any other cases.” The patient in question arrived at the clinic late but “is another case of undoubted radiation cataract who had suffered severe epilation and radiation sickness.”

He then had some time to shop in Nagasaki and “picked up a

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long looked for pin for Did (his wife). This time she will not be able to return it for a refund!"

Dr. Cogan returned to Hiroshima and the atomic commission eye clinic. "Two more cases of radiation cataracts today, making a total of eight. Both were heavily epilated but had little radiation sickness."

October 28, 1949. "One of the many confusing things about this trip in Japan and one of the most difficult for me to understand, is myself. Why I should have wanted to call up the mayor of Hiroshima and have gone to him is as much of a mystery to me as it must be to others." They discussed the mayor's plans for reconstruction of the city. The mayor iterated his desire to make Hiroshima a world peace memorial, "But if I'm not mistaken there's a little of the cozy businessman in the mayor." That afternoon he walked through the hypocenter region. "Picked up a roof tile among the debris that had been burned." The temperature at the hypocenter at the time of the blast reached 2,000 to 3,000 degrees centigrade — everything that was not incinerated, was burned.

November 4, 1949. "We have seen 10 radiation cataract patients to date, and we are through! The report is written; a preliminary note has been sent to Science, I am packed, and tonight we leave for Kure, then Tokyo, and we leave Japan. I am already becoming reflective, but the things which I shall remember most vividly are the sunsets over the inland sea and the pale blue of the skies, the soft pink clouds, the green (almost black) island mountains silhouetted against the light background. And in the foreground, the peasants carrying either babies or loads on their backs or pushing along carts of sweet potatoes or suspended on their shoulders the well-balanced water or night-soil buckets. All this, with a square-



Dr. David Cogan and wife Did Cogan at Osaka Castle, 1965.

rigged sampan or two thrown in, makes for thrills the like of which I have rarely experienced."

On November 6, 1949, Dr. Cogan left Tokyo for the United States. In the two months he had been in Hiroshima and Nagasaki, he had uncovered 10 cases of radiation cataracts among over 1,000 examined patients, all being within 550 to 950 meters from the bomb's hypocenters. "Now I'm anxious to get home and live a normal life again — or try to. When [Lt. Col. Carl F.] Tessmer [director of the atomic commission mission] asked me if I would be interested in returning to Japan for a repeat survey in several years hence, I said it should

be done. But I also said, "The next time the family goes with me."

Dr. Cogan returned to Japan in 1965, this time with his wife, Did. That trip also is an interesting story, but the details of that adventure, another of many in the life of a brilliant, humble and remarkable man, must await future recounting.

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We Are Animals

By Alfredo A. Sadun, MD, PhD

What does the world's reaction to Russia's invasion of Ukraine, COVID-19, partisan politics and physician burnout, all have in common? Biology.

That's right, human biology is the basis for human behavior. Human behavior can be looked at in many ways. But even our most sophisticated thoughts and actions derive from basic and now well understood biological processes. So, in a sense, even the most complicated political and cultural phenomena are determined by how our neurons connect, on how our synapses work, on how our hormones set the tone.

One aspect of this is that many people apply various sciences to the understanding of the things I began this essay with. But the sciences attack the problems at many distinct levels. The levels are all legitimate, but they frame the problems differently. There is a rise in crime. This can be considered in light of new laws, or lack of laws. Or we might analyze it in socioeconomic terms. Or maybe that childrearing is affected by different values and customs. I like to take it even further to issues of how people react to all the bad news we keep hearing, which in turn generates depression and stress hormones. It also adversely affects our sleep as well as our moods. Indeed, chronic anxiety gives us everything from ulcers

to closed-mindedness, to difficulties with learning and poor impulse control. All of these analyses are correct, but rarely do political scientists, or sociologists talk with neuroscientists or child behaviorists. But they are all connected. It's all biology.

Did you know that corticosteroids like glucocorticoid (the stress response) depresses the immune response? Of course, you did, as you regularly use these agents to treat uveitis. But you probably forgot that cortisol levels go up every time we watch the evening news. Or get into an argument with our neighbors over politics or gnash our teeth after a frustrating day at work arguing with insurance carriers. Cortisol is great for the fight or flight response (it increases blood pressure and blood sugar to get your muscles optimized), but it also puts most of the parasympathetic system on hold. Yet, it's the parasympathetic system that maintains your long-term health and builds resilience for tissues and organs. Too much fight or flight and your body and mind becomes a mess.

If you are a low-ranking baboon, you need all the cortisol you can muster to escape the bigger, badder boys from beating on you. But if you are a high ranking and secure baboon, you have better fur and will live a longer life. Sometimes, I think that our culture, and especially our media, has made us all feel like low-ranking baboons (See figure 1).

In another article of this issue of *Scope*, Dr. Samuel Masket writes about the new epidemic of physician burnout. It's serious and certainly another thing to worry about. But, paradoxically, worrying too much about it is a self-fulfilling prophecy. There are many reasons for physician burnout. But, in the end, these reasons probably converge as they all overtax our sympathetic nervous system, inundate us with cortisol and change the neurotransmitters and even the connections in our brain and the size of limbic and other structures. After long-term priming with cortisol, the prefrontal cortex has less control over our amygdala,

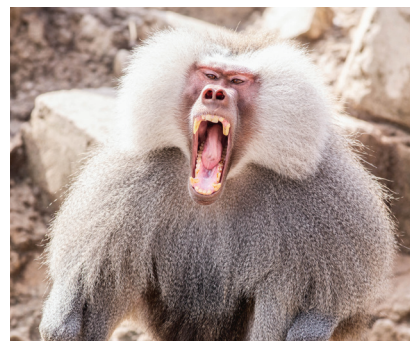


Figure 1 - Baboons "yawn" when they are asserting dominance. This baboon flashes the canines reminding other baboons of the consequences of fighting, like Putin mentioning that Russia has nuclear arms. The sight stimulates the amygdala of other baboons which raises cortisol levels.

and we are overreacting to feelings of fear and anxiety and sadness, which in turn causes us to make bad decisions that can lead to a vicious circle.

Stanford researcher and professor Robert Sapolsky touches on some of these issues in his excellent book, "Behave." He starts with the biology and goes from molecular interactions at the synapse to neurophysiology, to neuroanatomy to hormonal regulation to human behavior and even touches on the philosophy of ethics and the problems with jurisprudence. I want to emphasize his first principles: That the brain houses the mind. But it turns out, the body also influences the mind, as we have hormones and other bodily parts that contribute to our decision making. For example, if your heart races, you feel anxious, not the other way around. And if you relax your muscles, you feel good and happy. Even forcing a smile can fool the mind into thinking you really are happy.

The brain and body do their things based on two basic phenomena: genetics and the environment. No surprise there. But the consequences of this are surprising. If it's all determined, how can we hold anyone accountable? What does the criminal justice system say to the fact that no one chose their genes or their upbringing? Spe-

From the Editor's Desk

cifically, much of what mitigates our decision-making is the restraint that our prefrontal cortex imposes on our more impulsive and emotional limbic system. But the prefrontal cortex is the last area of the brain to develop. It's not fully myelinated until we reach the age of 25.

How can we give extreme punishments to younger adults, much less teenagers, when they are not really capable of full impulse control? That is logical, but that attitude goes nowhere as long as we believe in retribution. The logical extension is that no one should be judged too harshly. I take the attitude that the sense of justice upon which the system develops is itself an outgrowth of human behavior, which is both hard wired and socially encouraged for us to want and expect accountability.

So, what makes us human? All of it, obviously. But we can break down our human sides and see which brain areas are most crucial to such. For example, I always loved the TV series "Star Trek" because it had two leaders, each in my mind representing half of what we as humans are capable of. There was Mr. Spock, well-motivated but reducing everything to calculation. And there was Capt. James T. Kirk, who was intuitive and always followed his gut sense. In this sense, Spock was the prefrontal cortex which is proportionately larger in humans than any other species. The prefrontal cortex is there for attention and planning and to mitigate the emotional reactions to which we are all prey. It's the prefrontal cortex that largely keeps us from being emotional pinball machines (e.g., teenagers who still have underdeveloped prefrontal cortexes). But humans are very much products of our limbic system. And that "gut sense" can be very sophisticated and useful. Capt. Kirk didn't always react impulsively but integrated his gut feelings with some prefrontal cortex override. We are probably our best selves when we do such an integration constantly and smoothly.

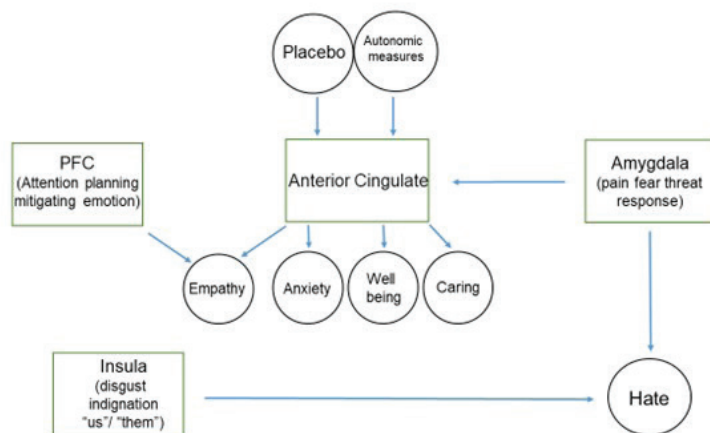


Figure 2 - Very simplistic diagram of how various brain centers modulate each other and our emotional perception of things. PFC = Prefrontal Cortex. Several recurrent loops and negative feedbacks have been left out, for clarity. For example, it should be noted that the PFC helps abate the Amygdala. It's especially interesting that the Insula, presumably evolved to regulate literal disgust, processes metaphorical disgust as well and this has been exploited effectively by propaganda that demonizes people as "vermin", etc.

But it gets complicated. The anterior cingulate gyrus is at the center of our feelings (ranging from anxiety to well being and empathy as well). And remarkably, the anterior cingulate gyrus is very sensitive to internal body measurements. That's the part of the brain that decides you are scared after noting that the heart is racing. It's also the part of the brain that seems sensitive to the effect of placebos (that's one reason many medications work so well)! But mostly, it's the amygdala that screams the need to respond to threats as it is always aware of pain and fear. Then, there's the insula that seems to be our center for disgust (of smells but also of categories of people and despicable actions) that seems to consider "us" vs. "them" in allocating indignation. If the Insula gets support from the amygdala, you get hate (figure 2). Now, of course, this simple analysis of brain areas is superficial and based on new studies, some of which are still controversial. And many of these terms (indignation, caring) are prone to philosophic deconstruction. But you get the picture.

So, when I watch CNN and see the wounded women and children being dragged out of a bombed-out theater in Ukraine, my amygdala

goes nuts with emotional pain, fear, and the need to warn me. This can now go two ways. The amygdala can get reinforced by my insula, that regards Russians as the major U.S. enemy and hence "them", to create intense feelings of hatred. That's easy. Or my amygdala can input my anterior cingulate gyrus and not only generate a sense of caring but added in with conscious thoughts from my prefrontal cortex allowing me to emphasize my feeling of sympathy. Should I donate to an agency that smuggles weapons to Ukraine to fight Russians, or to an agency that helps the refugees find a safe haven? If I do the latter, my anterior cingulate gyrus may bring me to a feeling of well-being. My cortisol levels will fall, and my heart rate will come down.

Very recent studies have shown that if you block cortisol receptors in mice and men, both will show more kindness to strangers, and that these functional brain changes can be reproduced naturally by trained Buddhists who concentrate on kindness in meditation. I don't know how to meditate, so if I'm kind, it's probably because my wife is very good at keeping my blood cortisol levels down. That's one way to avoid physician burnout.

On Pandemics: Historical Considerations of Pandemics – Part II

By Steven A. Newman, MD

Editor's note: Scope asked Steven Newman, MD, to put the COVID-19 pandemic into context. In this, the second part of a four-part series that looks at COVID within the context of other pandemics, we look at the history of pandemics.

Pandemics can be categorized chronologically. Egyptian mummies have evidence of smallpox involvement and it is possible that trachoma caused a pandemic in prehistory. Excavations in China also suggest pandemics may date back to at least 1000 BC. The Bible (Old and New Testaments) mentions severe epidemics but without enough information to identify timing or cause.

One of the earliest recorded pandemics (likely typhus) struck Athens during the Peloponnesian wars. Smallpox or possibly even bubonic plague may have been responsible for the Antonine and Cyprian Roman involvement. Bubonic plague which likely originated in East Asia ravaged Europe in the early part of the second millennium.

In 1609, Galileo Galilei applied his expertise in optics to also make use of the first practical microscope. The compound microscope was first developed in Holland by two Dutch spectacle-makers and father-and-son team, Hans and Zacharias Janssen first practi-

cal microscope in 1590. Scientist Anton van Leeuwenhoek used a microscope with one lens to observe insects and was first to observe bacteria. This permitted scientists and physicians to question the previous theories of etiology of disease. Leeuwenhoek detailed these achievements in almost 200 letters to the Royal

to a metal holder. The specimen was then viewed through a hole on the other side of the microscope and was focused using a screw.

This challenged the more conventional view that God or before that, pagan Gods, were the antecedent cause of various pandemics. Earlier, the Greeks, based on the teachings of Hippocrates blamed an imbalance of humors in the body. Treatment thus included sweating, urinating, defecating, vomiting, and of course bleeding in an attempt to rebalance the humors. Later outside influences were felt to play a role. These theories were grouped together as “miasma.”

Obviously, the leading example was malaria which was originally felt to be secondary to “bad air” hence its name.

Leeuwenhoek, Louis Pasteur, Robert Koch, and others eventually persuaded scholars that bacteria were the responsible parties for infectious disease. Anthrax, tuberculosis, and cholera had agents that could be seen and perhaps controlled, if not yet by antibiotics, then at least by sanitation.

Cholera became widespread in the 19th century, killing tens of millions of people. Between 1817 and 1824, the disease spread from the Indian subcontinent, particularly in Bengal, across India involving 10,000 British troops and thousands of Indians, extending as far as China and Indonesia. A recurrence of cholera occurred between 1826 and 1837 in Russia, Hungary, and Germany. In London, England and also the United States and Canada a severe outbreak of cholera occurred between



Figure 1 - El Museo de las Momias, mummies of Guanajuato, buried in 1833 due to a cholera epidemic.

Society in London where no less a person than Robert Hooke validated them. This work was based on a simple single lens, handheld microscope. The specimen was mounted on the top of the pointer, above which lay a convex lens attached

Steven Newman, MD

1819 and 1860. It also claimed 200,000 lives in Mexico (figure 1).

Between 1863 and 1875 there was spread involving Europe and Africa with particular emphasis on those attending the Haj to Mecca. An outbreak of cholera in 1856 killed some 50,000 Americans. Between 1883 and 1887 there were 250,000 deaths in Europe and at least 50,000 in the Americas. Later in Russia, a quarter of a million people died in 1892, 120,000 in Spain, 90,000 in Japan and 60,000 in Persia. The most recent cholera epidemic began in Indonesia, reached Bangladesh and India and the Soviet Union in 1966.

Typhoid fever is caused by a gram-negative organism related to salmonella. Typhoid, like cholera, is spread by fecal contamination. The first identification of an individual spreading disease was Mary Mallon a cook from Ireland who infected several individuals in New York. She was effectively quarantined for over 23 years. Typhoid was one of the first bacterial organisms treated prophylactically; mandatory vaccination of troops by the British before the second Boer War (1899). Vaccination dramatically reduced the incidence of typhoid during World War I.

In 1905, the U.S. Supreme Court considered and upheld mandatory vaccination for U.S. citizens. Mandatory vaccination for smallpox (a public health issue) for school attendance was upheld by the Supreme Court in 1922. With the last wild case of variola major (smallpox) in October 1975, the world was declared free of smallpox in May 1980.

Typhus was the cause of another pandemic (caused by rickettsia), which was particularly prominent during times of warfare and was also known colloquially as “Camp Fever.” As mentioned before, typhus was the likely cause of many deaths in Athens during the



Vaccinating the poor of New York City against smallpox in 1872. In 1863, mass production of smallpox vaccine was developed, allowing for broad immunization of North American and European populations.

Peloponnesian War. This disease would spread rapidly in cramped quarters such as ships. Typhus was first reported during the Crusades and had a major impact in Europe, in 1489 in Spain, and in Germany during the Thirty Years War between 1618 and 1648. Later, typhus would play a major role in Napoleon’s defeat in his invasion of Russia in 1812, where disease in combination with the cold killed many more Frenchman than did the Russians. It struck again during World War I when it killed more than 150,000 people in Serbia. In Russia, typhus killed approximately 3 million people 1822 -1918.

Koch went on not only to discover the bacillus causing tuberculosis, but also on a trip to Egypt was able to isolate the cholera bacillus. This, coupled with information regarding the transmission near the Broad Street pump, established the cholera bacillus as the cause of cholera. Asiatic cholera was epidemic in India then became pandemic in Asia between 1816 and 1830s, spread to Russia, Northeast Germany, and by 1831 appeared in England. It was first recognized in Virginia, particularly in the Tidewater region, in 1832, presumably introduced through Quebec. Mycobacteria, including tuberculosis (TB) and leprosy, accounted for multiple episodes of pandemic, par-

ticularly in sub-Saharan Africa. It has been estimated that one quarter of the world’s population has been exposed or infected with TB.

“So the final lesson of 1918, a simple one yet one most difficult to execute, is that those who occupy positions of authority must lessen the panic that can alienate all within a society. A society cannot function if it is every man for itself. Those in authority must retain the public’s trust,” said John M. Barry, author of “The Great Influenza.”

After the discovery and colonization of the new world, the smallpox epidemic probably killed between 5 million and 8 million of the indigenous population that were not immune. This was first recognized in 1519. The smallpox epidemic that soon followed probably killed 56 million people in the Americas.

The 20th century brought us the Spanish Flu of 1918 regarded as one of the worst (in terms of numbers of people who died) epidemics of all time. But that’s a story for the third part of our series.

Read other parts of the series:

- [Part 1: Etiology of Pandemics](#)
- [Part 3: Influenzas \(Spanish Flu of 1918\) — Coming](#)
- [Part 4: COVID-19 — Coming](#)

What We Are Doing Today — Malcolm R. Ing, MD

By Alfredo A. Sadun, MD, PhD

Alfredo A. Sadun, MD: Hi, Malcolm. I've heard fascinating things about you, and I'm very glad that you've agreed to this interview. Can you start by telling us about where you were born and what your childhood was like?

Malcolm Ing, MD: I was born in Honolulu October 31, 1934 to a Chinese American physician father and Caucasian mother of English, Irish and Scottish descent. My parents married in Philadelphia after my father completed his residency in urology at the University of Pennsylvania. At that time, interracial marriage was not common, and, in fact, both of my parents' families tried to discourage the union, so my parents eloped!

My father's practice of urology was difficult to establish in the Depression years, but he worked diligently to make ends meet. He worked as a volunteer physician at the local venereal disease clinics and told me that in those days, the only treatment the physicians had for syphilis was mercury and arsenic.

Dr. Sadun: Any interesting events during your childhood?

Dr. Ing: My boyhood years were more financially comfortable than those of my father, who was one of 11 children. But those days also included the bombing of Pearl Harbor on December 7, 1941. My dad, being in the U.S. Army Medical Reserve Corps, was called into action that day, and I will

never forget the family huddled around a radio in a blacked-out home wondering if the Japanese were going to invade Hawaii.



Malcolm R. Ing, MD, pictured in 2003. First place in the Hawaii State Championship, Legends Division (60 and over).

Dr. Sadun: Where did you go to school?

Dr. Ing: I finished my high school education at Punahou School and continued my formal, pre-med education at Harvard, where in 1954 I met Audrey Regut in Lamont Library. Knowledge is not the only thing obtained in an undergraduate library, because a longlasting love affair with Audrey began there and is going strong after 67 years! Yale University School of Medicine accepted me as

a student after three undergraduate years at Harvard, and after a surgical internship at UCLA in 1960, I finished a residency in ophthalmology at Yale in 1963. I completed my fellowship in pediatric ophthalmology with Drs. Frank Costenbader and Marshall Parks in 1964.

Dr. Sadun: That must have been at Children's Hospital in Washington, D.C. Then what?

Dr. Ing: The Vietnam War resulted in my serving in the U.S. Army Medical Corps, but this duty brought me back to Hawaii and surfing. Audrey and I happily raised three girls in Honolulu, and now have three grandchildren and four great grandchildren.

Dr. Sadun: And academically?

Dr. Ing: While in Honolulu, I served as chair of ophthalmology at the John A. Burns School of Medicine from 1983 through 2020. I am a member of the American Ophthalmological Society and serve on the council of the Hawaii Medical Association. I have published 65 peer-reviewed articles for medical journals and contributed four chapters in textbooks on strabismus surgery.

Dr. Sadun: Well, time to talk about your other life: Your avocation which has also brought you some notoriety. I hear you surf. How did that start?

Dr. Ing: I first started surfing at about age 14; that's when I bought my first surfboard. This board was a redwood hollow board, 12 feet in length, and it weighed 54 pounds. For the younger generation, that's a very heavy board. There were no fins on the board, and it was very hard to turn in the waves. My pres-

Malcolm R. Ing, MD

ent board by comparison is only 10 feet long and weighs only 20 pounds, and I can use it to “curl” in the waves as much as possible.

Dr. Sadun: But did you start surfing because of some influence?

Dr. Ing: When I was very young, I often heard my dad discuss the fact that I had an uncle. He was a Waikiki “beach boy” and he used to surf with the legendary Duke Kahanamoku. The “Duke” was not only an Olympic swimming champion, but he introduced surfing to most of the rest of the world.

Dr. Sadun: You mentioned big heavy boards that transformed. What was that about?

Dr. Ing: By the time I returned to my birthplace, Hawaii, in 1966, surfboards had changed from wood to foam and fiberglass. This meant that they were much shorter and lighter; easier to carry and better to turn in the water.

Dr. Sadun: Were you good?

Dr. Ing: I entered my first surfing contest in Hawaii in 1968; the oldest age division at the time was



Dr. Ing pictured with surf buddy, Hurricane Brown, at the 2019 Hawaii State Championships, Golden Legends Division (80 and over).



“In the Curl” (with protective eyewear).

35 years and older as a category. Little did I know at that time that I would still be competing in the over 40 surf meets now 52 years later! I presently hold the title in the Golden Legends Division (80 years and up) in the Hawaii Amateur State Surfing Championships.

Dr. Sadun: What do you like most about surfing?

Dr. Ing: Mostly, I like the exercise and the rough and tumble atmosphere. This contrasts with the precise nature of ocular surgery that I still perform doing strabismus surgery, my chosen subspecialty being pediatric ophthalmology. Surfing gives me a great chance to admire the beauty and refreshing nature of the ocean.

Surfing and ophthalmology intersect in two areas. I try to protect my eyes from sunlight damage, and I wear protective shatterproof eyewear at all times on the ocean. I have also had to surgically repair eyes which have been damaged by the sharp front end of the new smaller surf-

boards. For all young surfers in the water beside me, I advise the use of a soft silicone tip applied at the front end of the board that decreases the chance of an injury.

As far as injuries go — not long ago, I attended a case in which the sharp tip of a surf board entered 2 inches into a man’s orbit and gave the patient a penetrating wound, that was unreparable.

I testified significantly at our Hawaii State Legislature to lobby for the creation of a high school interscholastic sport of surfing. I pointed out to the legislators that I was still engaged in this sport after 50 years. I told them that I believed surfing offered a great opportunity to remain physically active, whereas other high school sports such as football were less sustainable and would not be possible as activities for senior age groups.

Dr. Sadun: Where do you go from here?

Dr. Ing: I look forward to competing in the 90-plus division in the future!

Remembering Paul A. Chandler, MD

By David K. Dueker, MD

The legacy of Paul Austin Chandler, MD (1896-1987) deserves to be remembered for many reasons.

A Harvard professorship bears his name as does one of the most respected glaucoma organizations, the Chandler-Grant Glaucoma Society. In addition, the recently released sixth edition of “Chandler and Grant’s Glaucoma” is one of the preeminent textbooks in the field.

It’s impossible to convey the full range and depth of Dr. Chandler’s contributions in the space of this article. But hopefully I can provide some basic insight into how Dr. Chandler earned such profound respect in the field of glaucoma by reviewing some of his significant contributions, in the context of a tireless teacher, a skilled clinician and master surgeon and as a pioneer of new insights into glaucoma diagnosis and treatment.

Dr. Chandler was educated at Harvard Medical School and completed his residency training in ophthalmology at the Massachusetts Eye and Ear Infirmary. After residency, he briefly practiced in Nebraska, but soon returned to Boston, where he joined the clinical staff at Mass Eye and Ear and developed a referral practice with special emphasis on glaucoma. He was an avid teacher, and once back in Boston, he started giving well-regarded lectures on clinical glaucoma management.

Around 1940, he was joined in this teaching effort by his friend and colleague, W. Morton Grant, MD. In 1964, Drs. Chandler and Grant were invited to give a series of talks at the New Eng-

land Ophthalmological Society. A year later, their talks coalesced into a book. Chandler and Grant published “Lectures on Glaucoma.” Their initial book remains remarkably readable and informative, providing thoughtful and practical guidance aimed at the ophthalmic practitioner caring for patients with glaucoma.

consultant. Colleagues appreciated his exceptional knowledge of glaucoma, which he conveyed in a clear and straightforward manner. His surgical skills were exceptional, and he was always eager to share surgical advice and compare methods. Once convinced of the value of peripheral iridectomy for treating a narrow angle, Dr. Chandler became an ardent proponent and practitioner of the procedure, but he was always quick

to point out that credit for the theory behind the operation — relative pupillary block — belonged to others. Although not the originator of peripheral iridectomy, he did introduce important new modes of therapy — both medical and surgical — for malignant (ciliary block) glaucoma, one of the most devastating post-operative complications of surgery for narrow angle glaucoma.

Malignant glaucoma is a particularly troublesome condition characterized by elevated intraocular pressure along with marked, unrelenting shallowing of the anterior chamber, typically developing after filtration surgery for uncontrolled angle closure glaucoma. Reasoning that relaxation of the ciliary body, by increasing tension in the lens zonules, might deepen a flattened anterior chamber, Drs. Chandler and Grant initiated a trial of mydriatic-cycloplegic treatment in malignant glaucoma. This new therapy was successful in all eight of their initial cases, and it remains a useful therapy for this condition. By odd chance, the treatment was unsuccessful in their next six cases, which resulted in



Paul A. Chandler, MD, image reprinted with permission from the Abraham Pollen Archives at Massachusetts Eye and Ear.

land Ophthalmological Society. A year later, their talks coalesced into a book. Chandler and Grant published “Lectures on Glaucoma.” Their initial book remains remarkably readable and informative, providing thoughtful and practical guidance aimed at the ophthalmic practitioner caring for patients with glaucoma.

Dr. Chandler created a prominent reputation as a glaucoma

Paul A. Chandler, MD

instructive discussions, particularly with their trainees, because a potentially useful treatment could have easily been rejected if the order of cases had been reversed.

When medical therapy fails, malignant glaucoma requires surgery, and Dr. Chandler was a thoughtful contributor to the development of effective surgical management for this condition. In these extreme cases, some surgeons had resorted to lens removal, sometimes with good effect. But lens removal was an awkward choice, since, in some cases the lens was still clear, and intracapsular extraction — the standard at the time — required major (large incision) surgery on what was usually a highly inflamed eye. San Francisco ophthalmologist Robert N. Shaffer, MD, had developed the hypothesis that the cause of the shallow chamber was a misdirection of aqueous humor into the vitreous where it was trapped. Dr. Shaffer had advocated releasing this trapped aqueous using deep incisions into the vitreous face after lens removal. Dr. Shaffer's success with this approach agreed with Dr. Chandler's observation that lens removal was most beneficial when accompanied by vitreous loss.

To relieve trapped aqueous while avoiding potentially hazardous lens removal, Dr. Chandler developed a new method to remove aqueous humor that was being trapped posteriorly. He introduced a large bore needle directly into the vitreous space — passing the tip posteriorly, through a peripheral iridectomy and underlying zonules and between the edge of the lens and the tips of the ciliary processes — a “peri-lenticular incision.” He had good success with this bold and innovative technique in a small number of cases, though he later abandoned it due to complications — mainly cataract. It was later refined and revived and incorporated into an elegant stepwise approach by his

associates, Dr. Richard J. Simmons and Dr. Grant. Of interest, in pseudophakic eyes, successful surgical results are now being reported by anterior segment surgeons using Dr. Chandler's peri-lenticular pathway to treat malignant glaucoma.

Another of Dr. Chandler's notable contributions was his description of a unique form of essential iris atrophy now known as Chandler's syndrome. This paper, like many of his clinical reports, was based on his meticulous and well-documented study of a small number of cases. The unique character of these cases, in contrast to essential iris atrophy, was a distinctive abnormality of the corneal endothelium (creating a “hammered silver” appearance), very mild iris alteration (no full thickness “holes”) and mild glaucoma that was more likely to cause corneal edema than to damage the optic nerve.

Before concluding, I would like to make some comment on Dr. Chandler's character and values. Many important attributes are revealed by his lifelong commitment to all forms of teaching, his steadfast support of his colleagues, his responsive and effective care of patients and his remarkable energy and interest in all facets of glaucoma. His fame built up slowly, year by year, on a foundation formed by patience and persistence coupled with his excellent powers of observation and an ever-present desire to improve patient care.

Consider, as an example that the first edition of “Lectures on Glaucoma” was distilled from 30 years of public lectures — material honed, refined and improved before a live audience. Dr. Chandler was fond of Newton's quote regarding the way scientific knowledge expands: “We stand on the shoulders of giants.” For Dr. Chandler this was a sincere expression of his humility and gratitude for his education and the opportunities it had provided him. He was naturally pleased that he had been able to contribute personally in his

chosen field, but he maintained a healthy and balanced perspective, and readily acknowledged the influence of others on his thinking.

Furthermore, he was friendly and easy to talk with, honest and down-to-earth, and he knew how to laugh at himself, as this story shows. Although he was often sought out for consultation, he was also often ready to seek consultation for himself when he found a situation puzzling. This often meant sending a case over to the Howe Lab for Dr. Morton Grant's input. On this occasion he sent a young man with unexplained mild and intermittent glaucoma symptoms in one eye. Dr. Chandler called Dr. Grant and asked if he had solved the mystery. Dr. Grant responded: “Yes, I have. I think this man has Chandler's syndrome.” The master clinician had missed diagnosing his own syndrome! Both men laughed heartily at this ironic twist, and afterward this “teaching moment” was freely and frequently shared with others.

In closing, I'd like to give a final tribute to Dr. Chandler's role in shaping the learning environment at the Mass Eye and Ear — namely, his participation in the weekly glaucoma meeting in Dr. Grant's laboratory. These were small meetings characterized by their informality and welcoming atmosphere. There was no written agenda — anything glaucoma related was appropriate, and exchange of ideas was free and open. It's hard to explain fully, but almost always the conversation was vital and exciting. Dr. Chandler came to meetings eager and full of interest, happy to listen to others, and, when asked, happy to share from his own rich experience — freely discussing not just moments of triumph, but also occasions with troubling clinical outcomes as well. He participated and contributed, but didn't dominate, and in this way he helped establish the unique atmosphere of these valuable gatherings.

Dr. Chandler has earned an enviable reputation in glaucoma — he has become one of those giants on whose shoulders those who follow now stand.

Physician Burnout and Wellness

By Samuel Masket, MD

Concern for physician wellness and burnout are important matters that have been deserving of serious attention for quite some time.

Only now, likely in response to the COVID-19 pandemic, are these issues receiving needed recognition. But, make no mistake that the seeds for doctors' discontent were sown earlier. As an example, during a routine visit to a recently hired hospital internist, he mentioned that he was "clicking his way through life," in describing his current chore in dealing with "dropdown" menus of his electronic health records (EHR).

This was in distinction to his earlier and more satisfying life in private practice. For present day senior ophthalmologists, wellness, ergonomics, and burnout were rarely, if at all, considered in our training programs or the bulk of our days in practice. We might view our generational standard of overwork and "self-sacrifice" as a tradition and part of the dues that we voluntarily paid during training and then beyond in trade for what was once our autonomy and our elevated position in society. Loss of self-esteem clearly has a negative impact on physician wellness.

Retired senior ophthalmologists, removed from the trends of contemporary practice (employee status, private equity, etc.), may not share the pain of what our younger colleagues are experiencing. Among the generational differences is the debt that many young physicians have accumulated on their way through the educational process. It is not uncommon for them to have student loans to repay that are well in excess of \$250,000, only to face reduced reimbursements on arrival in practice. That scenario fortunately didn't apply to senior ophthalmolo-

gists, but is quite concerning for our junior colleagues.

Among the underlying causes of burnout are loss of physician autonomy, bureaucratic snafus, loss of the doctor-patient relationship, trivialization of medical expertise gained over time, reduced reimbursements, EHRs, etc. Some of these factors have required that physicians work longer hours and increase their "throughput" of patients, often leading to fatigue, both mental and physical. Burnout is a form of chronic stress that leads to the sense of exhaustion, detachment, pessimism and feelings of ineffectiveness; the signs of burnout may include chronic fatigue, insomnia, pessimism, and isolation and these feelings may lead to poor job performance and lessened productivity. Moreover, poor ergonomics in the workplace may increase the likelihood for musculoskeletal disease (MSD) and chronic fatigue. This is particularly problematic for ophthalmologists.

Clearly, the pandemic and its effects on the overall healthcare community has brought to light concerns regarding physician well-being across the board. Much of the available information on these subjects comes not only from the peer reviewed literature, but from

Medscape and other online medical information news services. In a February 2022 Medscape poll of 1,170 various types of U.S. health care workers, 23% indicated their intention to leave the industry. In a recent and more extensive physician specific survey of 13,000 U.S. physicians across a variety of specialties (conducted in fall 2021 and reported in January 2022), it

For present day senior ophthalmologists, wellness, ergonomics, and burnout were rarely, if at all, considered in our training programs or the bulk of our days in practice.

is astounding to note that overall, 47% of all MDs sense burnout, up 5% from just one year before.

Ophthalmologists reported a lower incidence (40% rate of self-reported burnout), than did ER physicians where a 60% prevalence was noted. It is interesting to observe, however, that the great majority of those who sense burnout presently noted it prior to the pandemic, as can be noted in figure 1 from the January 2021 Medscape survey

Did Your Burnout Begin Before or After the Start of the COVID-19 Pandemic?



Figure 1 – Percentage of physicians sensing burnout prior to and after the COVID-19 pandemic (Kane L. 'Death by 1000 Cuts': Medscape National Physician Burnout & Suicide Report 2021. Medscape. Published January 22, 2021).

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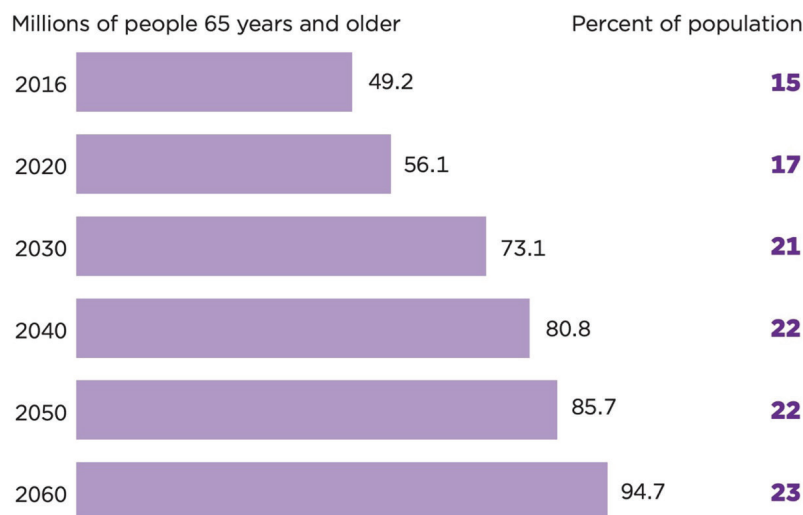
of 12,000 U.S. physicians (taken in the fall 2020). Also from the 2022 survey, we learn that the percentage of those who were very unhappy prior to COVID-19 has more than doubled from 4% to 10% since the pandemic.

If there is a positive side to the pandemic it is that society has gained respect for healthcare providers and that physician wellness is a growing concern. This is of particular significance as we face potential physician work force shortages. According to Dr. Roni Devlin, from her January 2022 Medscape blog, 43% of physicians are considering early retirement. Loss of a significant portion of the physician workforce could have dire consequences downstream as we are experiencing a “graying of society.”

Figure 2 depicts U.S. demographics with respect to the projected portion of the U.S. population over age 65 for the future. Note that between 2020 and 2040 there is an anticipated increase of more than 24 million people. That figure will certainly impact ophthalmologic care since cataract, glaucoma, macular degeneration and all age-related conditions will see a marked

Projections of the Older Adult Population: 2020 to 2060

By 2060, nearly one in four Americans is projected to be an older adult.



Source: U.S. Census Bureau, 2017 National Population Projections.

Figure 2 – Projected future US demographics. (US Census Bureau)

increase in incidence. Will we have enough ophthalmologists to handle the increased patient load? This is a problem because our profession is not presently growing. Added to this, senior ophthalmologists (above age 60) currently represent 43% of Academy membership. Doctors are “graying” as well, perhaps even faster than the population at large. Figure 3, from the Medscape 2021 survey reveals that overall, 31% of U.S. physicians are above age 60.

Moreover, there appears to be a gender trend: More females exhibit burnout than their male counterparts. Again, from the 2022 Medscape survey, more than half of women physicians reported burnout, compared with 41% of males. What might account for the observed gender difference? In a *Harvard Business Review* article from January 2022 concerning diversity and inclusion, authors Jessica Dudley, Sarah McLaughlin and Thomas Lee cited a study that implicated the disproportionate role that female and male physicians have with regard to non-professional activities.

As examples, female physicians have a 25-fold greater likelihood for being responsible for child care and schooling and a 4.5-fold greater responsibility for household tasks. As the article indicates, these data suggest that female physicians have a far more difficult time in their ability to “decompress” upon returning home from work. Interestingly, this gap persists across all ages between 30 and 65, removing child rearing as the major cause.

The article also notes that female physicians take more time per

Demographics

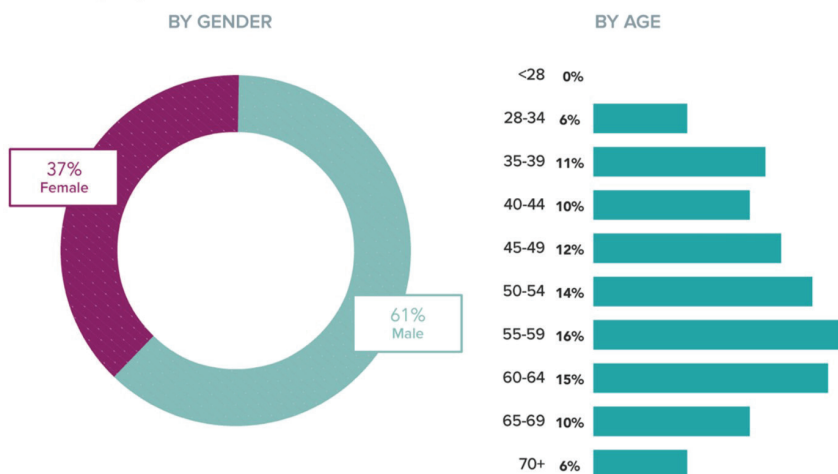


Figure 3 – Physician demographics (Kane L. ‘Death by 1000 Cuts’: Medscape National Physician Burnout & Suicide Report 2021. Medscape. Published January 22, 2021.

patient and more time in documenting the interaction on the EHR. Interestingly, the authors also suggest that the patients of women physicians have modestly better outcomes! But the net result is that female physicians have higher rates of burnout, lower rates of professional fulfillment, higher rates of depression, all resulting in women leaving medical practice. Given that women currently represent more than one-third of all U.S. physicians and a majority of current medical students, there are negative implications for the physician workforce over the long-term. In a November 16, 2021 article from *The Atlantic*, author Ed Yong reports that roughly 20% of health care workers

Interestingly, the authors also suggest that the patients of women physicians have modestly better outcomes! But the net result is that female physicians have higher rates of burnout, lower rates of professional fulfillment, higher rates of depression, all resulting in women leaving medical practice.

have left their jobs since the pandemic. He suggests that the workers aren't quitting because they can't handle their jobs. They're quitting because they can't handle being unable to do their jobs.

Even before COVID-19, many of them struggled to bridge the gap between the noble ideals of

their profession and the realities of it as a business. The pandemic simply pushed them past the limits of that compromise.

Other than gender differences and the obvious impact of the pandemic on certain specialties, emergency medicine and infectious diseases as examples, what has led to the surprisingly high rates of physician burnout and how could this have occurred? Figure 4 shows that practice setting has a significant impact of the proportion of physicians sensing burnout, with those in solo practice revealing the lowest rate. Given that many physicians are now employed by larger health care systems, rather than self-employed, it is easy to recognize that filling out EHRs and other bureaucratic tasks take away from the traditional doctor-patient relationships; some practitioners sense that they have become typists rather than care givers.

Figure 5 presents the key reasons for current dissatisfaction among physicians, according to the 2021 Medscape poll. It is remarkable to note that bureaucratic snafus are reported to be 6-fold more significant than is the stress of caring for COVID-19 patients. How deep does the problem go? 54% of the 13,000 physicians in the Medscape 2022

survey reveal that burnout has a strong or severe impact on life. Remarkably, burnout is now recognized as a diagnosable condition and has been added to the World Health Organization's 11th revision of the International Classification of Diseases (ICD-11). Certainly, burnout may result in suboptimal patient care, loss of physician productivity, medical errors, and personal concerns of the physician including depression, alcoholism, drug dependency and suicide. But on a positive note in our camp, according to Lucy Hicks, reporting for Medscape, ophthalmologists have lower rates of depression than do other specialists.

How are doctors coping with these issues? On one hand, doctors may alter the workplace environment, should they have the capacity to do so (figure 6). Of concern, is that more than a fourth have reduced their work hours, potentially contributing to workforce shortages, while a fifth have changed work settings. Overall, only 3% have placed their practices up for sale. Employed, rather than self-employed physicians have far less control over their work environments and that can create frustration and dissatisfaction. Employers have come to recognize that physicians want

Burnout by Work Setting

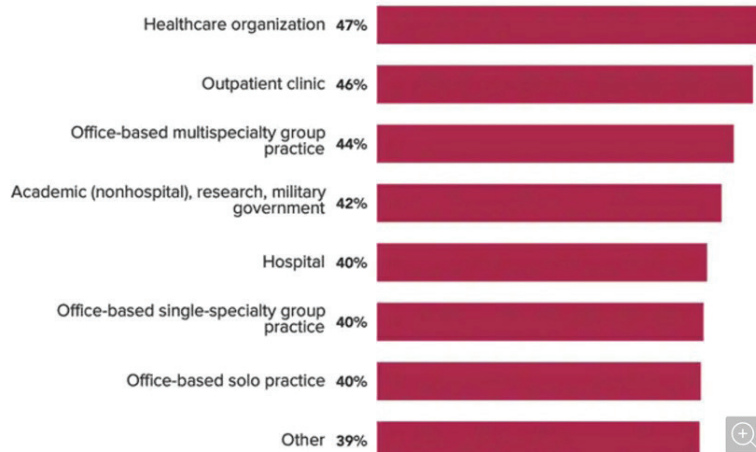


Figure 4 – Proportion of physicians burned out by work setting. (Kane L. 'Death by 1000 Cuts': Medscape National Physician Burnout & Suicide Report 2021. Medscape. Published January 22, 2021.)

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and need more direct control over patient care, and are not interested in corporate gifts, “trinkets” and coffee time snacks in exchange.

Doctors have also adapted by improving their own mental and physical health. As mentioned, above poor ergonomics in the workplace contributes to physical pain and fatigue, leading to musculoskeletal disorders; these are among the underlying causes of burnout. Physicians have also adapted to the challenges of burnout by addressing “survival strategies” in their out-of-office lifestyle, employing positive methods such as increasing exercise time and allowing them to combat both physical fatigue and mental stress.

Where does ophthalmology stack up in these arenas? Although 40% of ophthalmologists sense burnout, only 2% of respondents in the Medscape survey were ophthalmologists, accounting for roughly 260. Quite similarly, a recently conducted online survey specific to ophthalmology, with approximately 600 ophthalmologists responding found that 38% self-reported symptoms of burn-

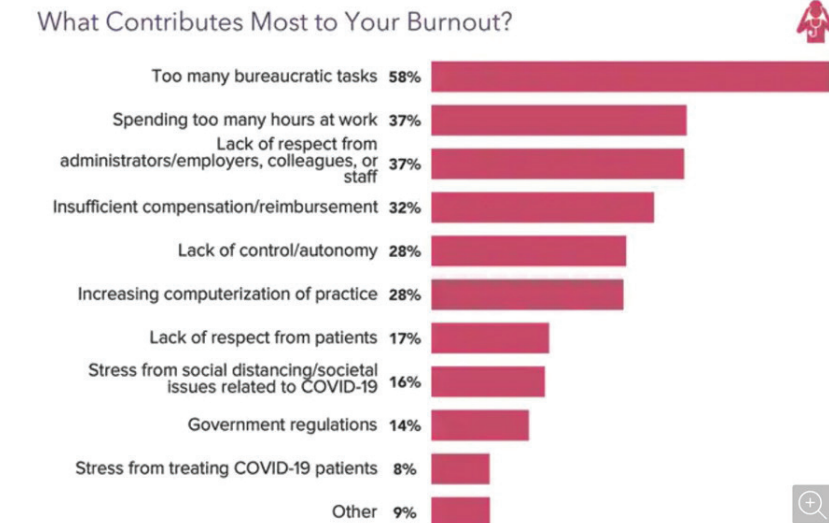


Figure 5 – Factors responsible for physician burnout. (Kane L. ‘Death by 1000 Cuts’: Medscape National Physician Burnout & Suicide Report 2021. Medscape. Published January 22, 2021.)

out. In keeping with the Medscape survey data, there was higher incidence among women and among ophthalmologists employed by hospitals, facilities, or academic centers as compared with those in private groups. Interestingly, among subspecialties, vitreo-retinal surgeons exhibited the lowest burnout ratio at 31% as compared with uveitis specialists at 45%; on a positive note, only 5.4% considered their burnout to be severe, while 65% indicated that it was mild.

Although it appears that burnout is presently a daunting problem in American medicine, the upside is that recognition of the problem is the first step toward its cure. That said, there remain large obstacles to overcome; the corporatization of medicine, reduced reimbursements for care, prior educational debts, “graying” of the populace and ergonomic challenges in office design, to name just a few. It is apparent that much needs to be done and it is uplifting to recognize that the Academy has begun to address these issues.

Of even greater significance is the Dr. Lorna Breen Health Care Provider Protection Act, just signed into federal law that recognizes physician burnout, provides grants to support related research and encourages mental health support for health care workers.

FURTHER RESOURCES

[Physician Wellness](#), American Academy of Ophthalmology

[Burned Out on Burnout?](#) Ruth D. Williams, MD, EyeNet® Magazine, American Academy of Ophthalmology, 2022

[5 Tips for Yoga and Mindfulness at Work](#), Camille V. Palma, MD, American Academy of Ophthalmology.

What Have You Done at Work to Try to Alleviate Burnout?

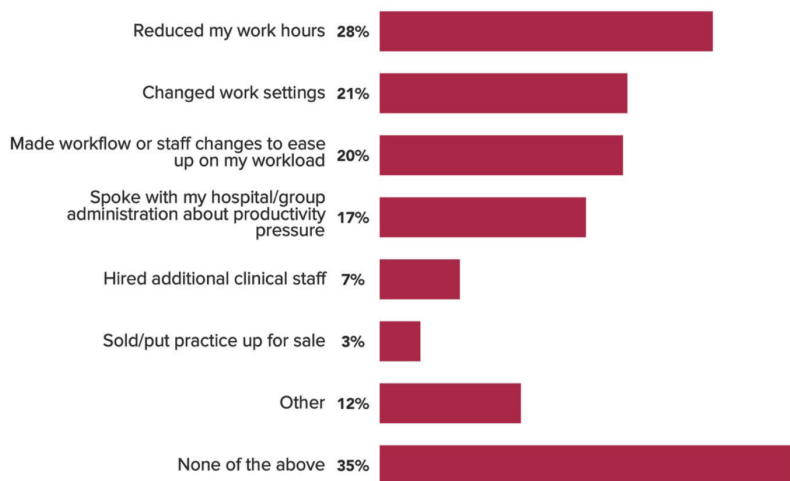
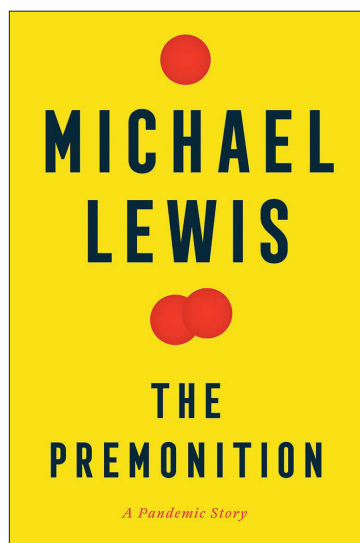


Figure 6 – Strategies to alter the workplace environment in response to burnout stress. (Kane L. ‘Death by 1000 Cuts’: Medscape National Physician Burnout & Suicide Report 2021. Medscape. Published January 22, 2021.)

What We're Reading This Spring 2022

Book Review Editor, Robert L. Stamper, MD

Senior ophthalmologists share the best of what they're reading this spring. Share what you're reading and send your review to our new book review editor, Robert L. Stamper, MD at scope@aao.org.



The Premonition: A Pandemic Story

By Michael Lewis
Reviewed by Robert L. Stamper, MD

What would American and world history have looked like if during Paul Revere's midnight ride, everyone shut their windows, and no one listened? There were Paul and Pauline Reveres in the recent past history of the United States who saw a pandemic coming, developed reasonable plans to deal with it and were either ignored, or worse, silenced.

Michael Lewis, a popular investigative reporter who brought us, among other nonfiction hits, "The Big Short" and "Moneyball," brings us another relatively fast-paced but well-researched and factual thriller that reads almost like a movie script, which it may well become.

Without giving too much away, the author takes us through the

first attempt, which started as a high school science project, at computer modeling of an infectious epidemic based on what was known about the 1918 flu pandemic. The heroes and heroines of this story are a small band of epidemiologists, as are most veterans of recent past epidemics like AIDS, Ebola and SARS. We learn not only about their sometimes-heroic

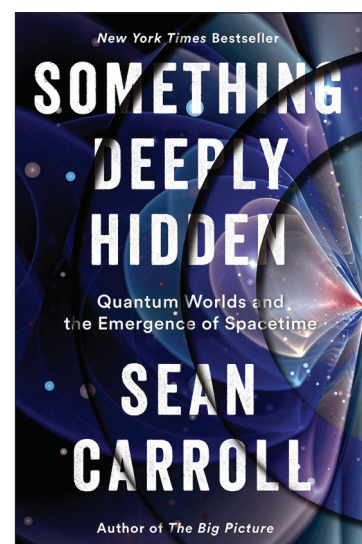
We learn not only about their sometimes-heroic activities in warning about and preparing plans to combat a major pandemic but about their personal lives and the sacrifices that were endured for their foresight.

activities in warning about and preparing plans to combat a major pandemic but about their personal lives and the sacrifices that were endured for their foresight.

The villains, no surprise, are not so much individuals but general political indifference and bureaucratic ineptitude. The Centers for Disease Control and Prevention was caught flat-footed since, due to political pressures, they had felt forced to focus on the physical characteristics of infectious agents rather than how they are spread. With little boots-on-

the-ground experience with an epidemic, they were unable to be effective leaders when the first SARS-CoV-2 cases appeared in our midst and when action would have been most effective.

Nearly 1 million Americans have died from this disease; it is likely that a significant proportion of these deaths could have been prevented. The COVID-19 pandemic showed the world how poorly prepared the U.S. health system was in dealing with such a disaster. There are many lessons to be learned from this entertaining educational yet depressing book and not just about a pandemic. If we again ignore those lessons, another pandemic or health crisis will surely find us equally unprepared and vulnerable to similar disastrous consequences.



Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime

By Sean Carroll
Reviewed by Alfredo A. Sadun, MD, PhD

Every few years, someone deeply qualified gives his take on the mysteries of quantum mechanics and the true reality of the universe.

Sean Carroll, a professor at the California Institute of Technology (who works mere yards from where I now type), has done a masterful job in explaining something so

What We're Reading

technical and difficult, yet accessible by the educated layman.

It was Richard Feynman, another Caltech professor and Nobel laureate whom I had a personal

Einstein thought that there were “hidden variables” at play, so that we just didn’t know the preordained outcome. Like a coin flip isn’t really random, just hard to predict. Einstein insisted that uncertainty became clarified, but that God did not place dice with the universe.

relationship with, who said, “I think I can safely say that nobody really understands quantum mechanics.” Which was significant since he was the one who did the most to verify the reality and utility of these weird events.

The present book has many ideas, but the nut of the quantum mechanics problem seems to be that it is very arbitrary that when the wavefunction collapses, only one of several realities becomes realized. This is the stuff along the lines of Schrödinger’s cat.

And it bothered physicist Erwin Schrödinger a great deal that the unopened box had neither an alive nor dead cat inside but one with the “smeared” potential to be either. It bothered him equally that with opening the box and observation, the waveform collapsed revealing either an alive or dead cat. It bothered lots of others as well, such as Albert Einstein.

Einstein thought that there were “hidden variables” at play, so that we just didn’t know the preordained outcome. Like a coin flip isn’t really random, just hard to predict. Einstein insisted that uncertainty became clarified, but that God did not place dice with the universe. But then John Bell sort of proved that wasn’t the case and maybe worse, that there exist interactions between events that are too far apart in space and too close together in time for the events to be connected even by signals moving at the speed of light. This challenges our very precious notion of causality. Hence physics has been in crises — until another physicist, Hugh Everett, came along with a new idea. He proposed that when the wavefunction collapsed all the outcomes occurred. So how to explain why we only see one? Because the others are in other universes. In Everett’s many worlds theory, each collapse of a wavefunction splits reality. It splits us too. But we only see the one universe; the others, that contain essentially the same version of us, are lost to us forever. But determinism still holds.

Carroll describes, in simple and lucid ways, without equations, the major objections to Everett’s view. And he concludes that they can all be resolved. He stops short of proving that Everett is right. That’s the problem, the Everett theory is fundamentally untestable. But it’s telling that in annual surveys of the American Physical Society, the attendees vote, and it turns out they mostly believe that Everett is right. So, think about it. As you are thinking, many copies of you are being made.

Watergate A New History



Garrett M. Graff

New York Times bestselling author of *The Only Plane in the Sky*

Watergate: A New History

By Garrett M. Graff

Reviewed by J. Kemper Campbell, MD

Readers fatigued by the partisan vitriol which characterizes national politics will find Garrett Graff’s voluminous new book, “Watergate: A New History”, a road map of how our country arrived at such a sorry state. A half-century ago, citizens were mesmerized by the media’s attention to a scandal involving the highest echelons of executive power and the most respected sources of national security, the FBI and CIA.

The whole sordid expose’ of government corruption became known as Watergate after an aborted burglary in a posh Washington, D.C., office-apartment complex was discovered. Exactly who had sent the “Keystone Kops” assortment of perpetrators or what they were trying to accomplish has never been established.

This meticulously researched and documented book should now become the definitive source for those who wish to dive into the cesspool of deceit, intrigue, and criminal behavior which were associated with the seemingly innocuous break-in and the cover-up. The scandal ultimately resulted in the resignation of our 37th president.

Richard M. Nixon had been elected for his second term in 1972 by a huge majority of voters. By 1974

What We're Reading

he had left his office in disgrace to avoid impeachment. He never seemed to comprehend the character deficiencies which doomed his legacy. He was later pardoned by his non-elected vice-president, Gerald Ford (who had been born as Leslie King Jr. in Omaha).

The impact of Watergate in affecting the public's perception of the presidency remains significant

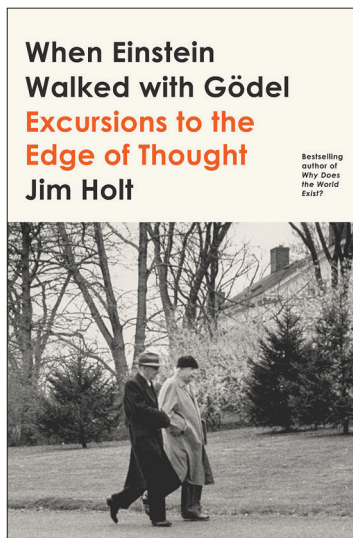
Many history-impaired readers may be shocked to discover that Nixon was neither impeached nor convicted of any crime despite the abundance of self-generated evidence available.

and to the present day continues to cast doubt on the veracity of any statement by the chief executive residing in the White House. Indeed, adding the suffix “-gate” to any noun immediately implies a vast and nefarious conspiracy. Those who make it through this book will understand that “worse than Watergate” is more than a frayed cliché. Many history-impaired readers may be shocked to discover that Nixon was neither impeached nor convicted of any crime despite the abundance of self-generated evidence available.

Readers who lived through the national ordeal will recall the colorful characters involved such as G. Gordon Liddy, Martha Mitchell, Robert Abplanalp, Spiro Agnew, Bebe Rebozo and even George Steinbrenner. The inclusion of two four-page inserts of black and white photos helps keep the bizarre cast of characters straight. Graff, a writ-

er and commentator for *The New York Times*, *Rolling Stone*, *PBS*, and *NPR*, for the most part avoids displaying his liberal perspective. He makes a valiant attempt to connect all the disparate threads from the confusing tapestry of multiple investigations, muffled tapes, and self-serving memoirs available. His organization of the book makes the 700-plus pages flow seamlessly as the investigators reach their inevitable conclusions.

In summary, this book should be required reading for any citizen with the faintest interest in how the sausage-factory of Washington, DC, politics functions and how our country has managed to arrive at today's dysfunctional impasse. Our present group of politicians should be sent the first copies.



When Einstein Walked with Gödel: Excursions to the Edge of Thought

By Jim Holt

Reviewed by Alfredo A. Sadun, MD, PhD

Jim Holt writes a series of essays, not really related, though they largely pertain to the almost mystical realm of mathematics. Where most of us normal people “see” different aspects of reality in the form of objects, people and other things, mathematicians “see” another realm that to them is as real and much more elegant than the worlds we inhabit.

Each essay has its own take-home message. What makes this all work is that Holt is, himself, a well-respected mathematician as well as writer who understands the subject of abstract and advanced math and also holds it in great

To me, the most interesting question that repeatedly comes up is why does mathematics describe the world so well.

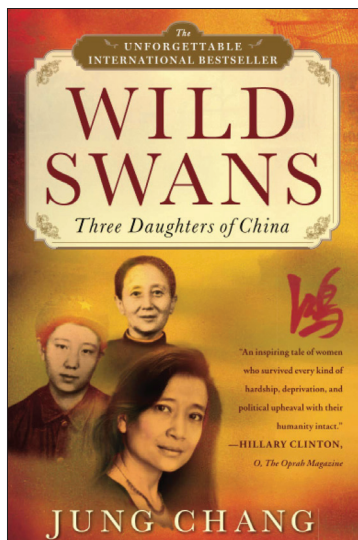
reverence. The book surveys several problems in mathematics and physics and touches on philosophy. But the best part is that it gives us a fairly intimate look at the personalities of some of the most interesting thinkers of the last century.

To me, the most interesting question that repeatedly comes up is why does mathematics describe the world so well. It's actually very remarkable. Every century, some great thinker advances his field by application of sophisticated mathematics. It works so well, it seems like cheating. And it almost always leads to predictions that come true. One can only sense that Galileo was right when he said, “mathematics is the language of God.” Then we must ask ourselves whether mathematics is more reality than what our senses can perceive. We see two apples. But two is probably more profound a reality than the ephemeral sight or smell of the apples.

The 24 main essays were all fascinating and thought provoking. There follows, at the end, a dozen or so very short works that summarize a bit of physics history. These,

What We're Reading

though informative, are not nearly as deep or compelling. For most of the essays there seems to be a predilection for Princeton-based thinkers. As examples, we learn about Albert Einstein, John Archibald Wheeler and Kurt Friedrich Gödel, who are all colorful and interesting. I enjoyed thinking about why our world must be 3 dimensional and not two- or four-dimensional. I particularly loved Gödel incompleteness theorems and the Riemann zeta conjecture of primes. And lest you say such topics are too rarefied to come up casually, I had a conversation on the Bernhard Reimann conjecture just last week. Anyway, it's not about whether these things are useful, but whether they give you new perspectives and thus enrich your thinking. You end up feeling, as well as thinking, that we are very small, and infinity is really big.



Wild Swans: Three Daughters of China

By Jung Chang

Reviewed by Samuel Masket, MD

“Wild Swans” provides an historical view of 20th-century China as told via the autobiography of a contemporary woman born in 1952.

Through the lives of her grandmother, sold as a concubine to a

warlord, her mother and father who were heavily invested in Chairman Mao Zedong’s Cultural Revolution and her own experience as a child of the revolution we learn much about China that was unknown to the outside world during Mao’s ascension. The book became an international best seller, with over 10 million copies in circulation but was banned in China. My sense is that we only came to peek into the arcane world of China in that era after the author emigrated to England in 1978 and became a naturalized citizen.

Writing chronologically, we first learn about her grandmother’s life in feudal northeastern Imperial China shortly after the turn of the 20th century. An interesting tidbit of the day dealt with the desirability of ultrasmall feet for women. Starting at a very young age, feet were tightly bound to stunt their growth; even more, when necessary, foot bones were crushed in order to prevent further growth, as small feet and shoes for women were considered to be desirable qualities to important men of the day. It’s a remarkable historical perspective on gender inequality!

Her parents’ lives (that of her father in particular) as converted and earnest party members, provide an interesting and intense backdrop to the tremendous upheaval of China’s leadership change from the Kuomintang to Mao Zedong’s communist regime; the latter would become a literal “hell on earth” with multimillions starving to death, other millions brow beaten, starved and physically pummeled into submission of their property to the state, and education and intellectualism highly devalued. Members of the communist party during the Cultural Revolution were all foot soldiers on the path to regulate daily life and control the minds and lives of the populace.

We learn of a fiscal five-year policy, Giant Leap Forward, to convert China’s agrarian society to col-

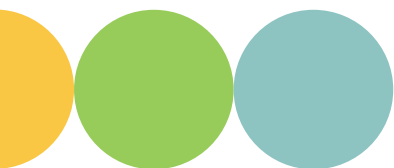
lectivism. Propaganda abounded to stimulate competition; stories were spread of some producers growing tomatoes the size of basketballs, not unlike the giant bananas seen in Woody Allen’s spoof, *Sleeper*.

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The Giant Leap Forward program failed miserably and resulted in hordes dying of starvation.

For a time, the author was a teenage zealot, joining Mao’s Red Guard and carrying the Little Red Book of Mao’s sayings as she traversed China with other youngsters in attempt to carry out Mao’s missions.

As we currently view the possible rebirth and spread of totalitarianism, this book is a must read for those who both cherish freedom and those who question its value.



Academy Foundation Update

News from the Foundation

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

The Foundation Advisory Board and staff are so grateful to all who gave back to support Academy programs last year. We raise a glass to you with hope for a steady recovery all around the world. We have many exciting programs planned.

NIGHT UNDER THE STARS AT THE ORBITAL GALA 2022

Christie L. Morse, MD, and the Orbital Gala Committee invite you to the 19th annual Orbital Gala at the Adler Planetarium on Sunday, Oct 2, in Chicago. This elegant cocktail party featuring one-of-a-kind auction treasures will support vital Academy programs and will be the highlight of the annual meeting! We are pleased to honor **Susan H. Day, MD**, for her commitment to ophthalmology and her patients. [Look for the link in June to make a tribute gift and have your message and photo included.](#)

THE PARKE CENTER CAMPAIGN

The Academy is building a new conference center at Academy headquarters that will enhance our ability to build and strengthen relationships with ophthalmic leaders and key partners. Named after former Academy CEO David W. Parke II, MD, the Parke Center will leverage existing plans to upgrade the current courtyard and adjacent spaces.

Thank you to our founding fund partners, the Ophthalmic Mutual Insurance Co. and David and Molly Pyott, and all of our generous supporters to date.

The Foundation seeks to raise \$2.5 million to create this new jewel and to date has raised over \$1.4 million dollars. Join our [donor](#)

[wall today](#) and be acknowledged as a founder in the future.

PLANNED GIVING

The 1896 Legacy Society, named for the year the Academy was founded, is a special group of donors who have included the foundation in their estate plans through cash gifts, bequests or other planned gifts. We would be honored to count you among its members. When you give to the American Academy of Ophthalmology Foundation through your will, trust or retirement plan, you create a legacy that will foster education for generations of your colleagues and improve their patients' care. [Learn more.](#)

REDUCING THE BURDEN OF MYOPIA

The prevalence of myopia has been increasing and is an important cause of visual impairment. The Academy is leading the charge to reduce the global burden of myopia by delaying myopia onset in children and reducing myopic progression in children and adolescents. Donate to the Foundation's ophthalmic education fund to help the Academy continue [its important work.](#)

AN EASY, AUTOMATED WAY TO GIVE BACK

There's a new, easy way to support Academy programs. [Make a monthly or quarterly recurring gift](#) and never think about it again while your dollars work on behalf of patients globally.

Thank you again for your continued support of the Academy Foundation. I wish you all the best as we look forward to AAO 2022 and this year's Orbital Gala in Chicago! Contact me any time at gskuta@aao.org.

SCOPE

The Senior Ophthalmologist Newsletter

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